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The Dental cosmos

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THE
DENTAL COSMOS:
A
MONTHLY RECORD OF DENTAL SCIENCE.

Dedicated to the Interests of the Profession.

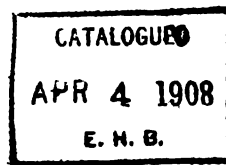
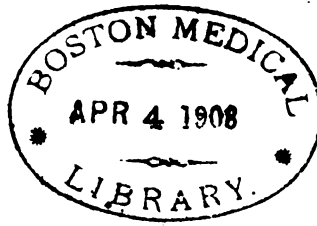
EDITED BY
EDWARD C. KIRK, D.D.S. Sc.D.

Observe — Compare — Reflect — Record.

VOLUME XLIX—1907.

PHILADELPHIA:
THE S. S. WHITE DENTAL MANUFACTURING CO.,
CHESTNUT STREET, CORNER OF TWELFTH.

1907.



CONTENTS OF VOLUME XLIX.

1907.

ORIGINAL COMMUNICATIONS.

Acid Auto-Intoxication and Systemic Disease the Cause of Erosion and Abrasion	1225	Experiments and Observations on the Wasting of Tooth Tissue Variousl Designated as Erosion, Abrasion, Chemical Abrasion, Denudation, etc.	1, 109, 225
Alveolar Infections: Extraction <i>vs.</i> Retention	708	Extensive Gold Inlays and Their Application to Bridge Work	690
Antiseptics and Disinfectants	579	Extraction (The) of Teeth a Surgical Procedure	354
Antiseptic Treatment of Pathological Conditions of the Oral Mucous Membrane	1132	F. D. I. Commission on Hygiene	366
Appendix to Article on "Facial Inharmonies"	930	Fifty Years of Dental Science with Its Fads and Foibles	1040
Banded (The) <i>vs.</i> the Bandless Crown	270	Forcing Eruption: a Case in Practice	266
Blue Light (The) and Heat as Therapeutic Agents	281	Free Dental Service in the Public Schools	565
Blue Ray (The) in Therapeutic Dentistry	824	Further Investigations of the Subject of Wasting	677
Burnished Gold Fillings	938	Gold Inlays	40
Case (A) of Congenital Total Absence of the Permanent Teeth	924	Gold Inlays in Compound Cavities of Molars. Involving the Mesio-occluding and Disto-occluding Surfaces	1034
Contour and Occlusion Obtained with Cast Fillings Without Waxing or Investing	468	Ground Porcelain Corners with Mechanical Anchorage	143
Corrected Case (A) of Pronounced Malocclusion of the Deciduous Teeth	820	Hygiene Maintained During the Progress of Orthodontia	943
Crowns Without Solder. Bridges With and Without Solder. and a Talk on Crown and Bridge Work	1251	Is the Cemented Filling the Filling of the Future?	1121
Degeneration (The) of Tissue. with Special Reference to the Oral Mucous Membrane	1025	Local Anesthesia in Dental Operations	555
Diagnosis (The) and Treatment of Antral Suppuration	909	Loss (The) of Teeth in Childhood, and Its Effect on Occlusion and the Face	1153
Dr. Miller's Observations on the Wasting of Tooth Tissue Variousl Designated as Erosion, etc., Viewed in Their Relation to the Power Possessed by Saliva of Controlling Acid Decalcification	801	Manual Training an Essential to Dental Education	469
Early Diagnosis (The) of Cancer	726	Method of Constructing Crowns for the Anterior Teeth	578
Educational Influence (The) of the So-called "Dental Meeting." Apart from Its Professional or Social Value	724	Method (A) of Repair that Can Successfully be Applied to Some Cases of Fractured Bridge or Crown Facings	280
		Method of Taking Impressions for Porcelain and Gold Inlays by Means of Strips of Aluminum in Combination with Dental Lac	454
		New Adaptation (A) of the Microscope to Dentistry	358

New and Accurate Method (A) of Making Gold Inlays.....	1117	Removable Bridges with Gold Inlay Abutments and Saddle and Vulcanite Attachment	154
New and Easy Method (A) of Making Perfect Gold Fillings.....	146	Repair of Porcelain Fillings.....	369
New Method (A) of Obtaining Plaster Impressions in Difficult Cases.....	278	Report of a Case of Extensive Injury to the Bones of the Face, and of a Case of Post-Typhoid Osteomyelitis of the Mandible.....	262
Nitrous Oxid and Oxygen: Its Possibilities and Practicability as a General Anesthetic	1140	Retention (The) of Deciduous Teeth in Adults	921
Non-union of Double Fracture of the Mandible Successfully Treated After a Lapse of Two Months.....	728	Review (A) of the Methods Employed for the Retention of Fillings.....	362
On Preparing Dental Papers.....	1148	Rise and Development of Intermaxillary Force	443
On the Pathology of Pericemental Inflammation	695	Setting Crowns and Bridges with Gutta-percha	453
Opsonism Applied to Pyorrhea.....	570	Some Abscesses of Dental Origin which Open Outside the Mouth.....	919
Oral Hygiene in Public Schools and Institutions: What are We Going to Do About It?.....	559	Study (A) of the Vascular Lesions of the Dental Pulp: Their Complications and Clinical Significance.....	124
Orthodontia and Orthopedia of the Face	1262	Supplementary Retaining Forces as Auxiliaries to the Labial Retaining Appliance	23
Orthodontia as a Prophylactic Measure.	337	Surgical Treatment of a Deformed Maxilla	929
Orthodontia: Opening the Bite in the Regulation of the Teeth: A Metal Flange for Improving the Anchorage of Appliances, Moving Teeth, and for Harmonizing the Occlusion.....	343	System (A) of Crowning and Bridging by the Aid of a New Crown.....	1245
Our Old Stand-bys.....	936	System of Utilizing Atmospheric Pressure for the Retention of Lower Plates	371
Pharmacopeial Revision	573	Teeth (The) in Relation to Ear and Throat Diseases	553
Pierre Fauchard	1233	Three Orthodontia Cases	148
Platinum Matrices and Pure Gold in Inlay Work	817	Time-Saving Attachment (A) for the Arch Bar	1260
Porcelain Rod (The) in Dentistry....	31	Traumatic Lesions Incident to Crowns and Bridges	1046
Present Status (The) of the Porcelain Inlay	433	Treatment and Filling of Root-canals..	1044
Preventive Medicine	1136	Treatment of Pyorrhea Alveolaris....	247
Prosthetic Nomenclature	456	Unique Method of Supplying a Missing Anterior Tooth	153
Pulp-Mummification	940	Use (The) of Compressed Air in the Office and Laboratory.....	722
Purposes (The) and Accomplishments of Modern Orthodontia	1128	Vacancy (A) in Dental Journalism...	466
Rambling Discourse (A) on Inlays....	827	Value (The) of Association.....	1030
Recreation for the Dentist.....	717	Wanted!—A Pathological Sense.....	815
Recreations for the Dentist, with Some Basic Requirements	1255		
Reflected Shadows Accompanying Porcelain Fillings	438		
Relation (The) of Diet to Interstitial Gingivitis	808		

Papers in Society Proceedings.

Aging of the Tissues with Special Reference to Given Forms of Dental Abnormality and Disease.....	745	America a Land of Unlimited Opportunities	78
		And They Say 'Comparisons are Odious'	1078

Appeal (An) to the Younger Men of the Profession	859	Dental Society of the State of New York	1050
Co-operation in Dentistry	730	National Dental Association.....	105
Correction (The) of a Misplaced Anterior Tooth by Means of Porcelain....	985	Northeastern Dental Association.....	835
Correction (The) of Facial Inharmonies	850	Pennsylvania State Dental Society...	1065
Dental Education	598	"Pressure Anesthesia" and the Removal of Living Pulp.....	505
Discussion (A) of the Merits and Demerits of the Gold Inlay.....	392	Prophylaxis a Factor in Dental Education	503
Does the Cemented Filling Preserve Tooth-Structure Better than the Filling Inserted Without Cement?.....	616	Remarkable History (The) of the Profession and the Splendid Character of the Men of the Past who Helped to Build It Up.....	495
Educational Problem (The).....	172	Report of Committee on Operative Dentistry (Union Meeting at Washington, D. C.).....	613
Lymphatic Stimulation in Dental Practice	305	Report of Committee on Oral Hygiene (National Dental Association).....	292
New Pharmacopeia (The).....	840	Report of Committee on Practice (New York State Dental Society).....	50
Opening the Doors of Dental Knowledge to the People	1270	Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation	484
Operative Dentistry	185	Silver Nitrate and Preventive Dentistry	1090
Oral Hygiene in the State Association.	313	Some Thoughts Concerning the Contact of the Teeth.....	373
Oral Surgery. [Summary.]	1286	Thoroughness in Dentistry.....	753
Orthodontia of Today from the Standpoint of the Orthodontist.....	986		
Phases of Art in Prosthesis.....	379		
President's Address—			
Connecticut State Dental Association	947		

CORRESPONDENCE.

Army and Navy Dental Legislation, 1266, 1303	Instance (An) of the Endowment of a Dental School	283
Dental Instruments Included in Surgical Equipment of Russian Warships....	Matrix (The) as an Aid in Cavity Preparation	720
Dentists, Stomatologists, and International Medical Congresses.....	Mixture of Gases in Oxyhydrogen Blow-pipe	283
Distal Cavities in Deciduous Second Molars	Pulp-Mummification	1160
Dr. Miller's Litmus Test.....	Question (The) of Priority Again—"The Matrix as an Aid in Cavity Preparation"	834
Formalin and Tricresol in Combination in the Treatment of Putrescent Pulp.	Salol in Tooth-Powders.....	471
158, 284	Substitute (A) for Pin Facings in Repairing Bridges	1161
Gold, or Gold and Platinum, Cemented Linings for Amalgam and Gold Fillings		
1157		

PROCEEDINGS OF SOCIETIES.

American Dental Club of Paris. 753. 985. 1090	District of Columbia Dental Society and the Maryland State Dental Association	582, 740
Connecticut State Dental Association, 62, 946, 1074, 1170	First District Dental Society, State of New York	390, 972
Dental Society of the State of New York, 43, 1050, 1192, 1291		

International Dental Federation—Gen- eva Meeting	472	Section III	298
Maryland State Dental Association and the District of Columbia Dental So- ciety	582, 740	Clinics	512
Massachusetts Dental Society, 70, 159, 1181, 1270		New York Odontological Society, 185, 387, 616, 744, 1162	
National Dental Association—		Northeastern Dental Association...835,	961
General Sessions.....	164, 285	Pennsylvania State Dental Society, 194, 1065, 1173	
Section I	373, 475	Report of the San Francisco Dental Re- lief Committee	632
Section II	495	Seventh and Eighth District Dental So- cieties of the State of New York.730,	980

EDITORIAL.

Amphoteric Reaction (The).....	404	Editorial Prerogative (The).....	868
Army and Navy Dental Legislation....	1301	Education and Memorizing.....	519
Close of the Volume.....	1306	"Educational Problem" (The).....	202
Code (The) of Ethics.....	315	It Hath "a Very Ancient and a Fish- like Smell"	995
Concerning Dental Libraries.....	635	Memorial (A) to Willoughby D. Miller	1305
Corrections—		Passing (The) of Professor Miller....	997
Dr. A. Hopewell-Smith's article, "A Study of the Vascular Lesions of the Dental Pulp"	407	Position (The) of Dentistry.....	1093
Dr. C. S. Van Horn's article, "A Rambling Discourse on Inlays"....	999	Question (A) of Journalistic Ethics...	82
Dr. W. D. Miller's publications....	1097	Shall We Nationalize Our National As- sociation?	1198
Dentists and the International Medical Congress	761	Two Great Meetings.....	873
		What Has Become of It?.....	1201

BIBLIOGRAPHICAL.

American Pocket Medical Dictionary (The)	875	Lecture-Notes on Chemistry for Dental Students	87
American Text-book (The) of Pros- thetic Dentistry	408	Manuel de Thérapieutique Dentaire Odon- tothérapie	88
Anatomical Nomenclature	410	Plaster of Paris, and How to Use It...	767

REVIEW OF CURRENT DENTAL LITERATURE.

Acquired Atrophy of the Maxillæ.....	1208	Hydrogen Dioxid	1001
Actinomycosis of the Cheek Cured by Potassium Iodid; with Suggestions as to the Possible Means of Infection and Spread of the Disease.....	527	Bruxomania (Gritting of the Teeth)...	525
Action of General Anesthetics.....	412	Carcinoma of the Mouth.....	642
Action of Iron Preparations upon the Teeth	1103	Cases of Actinomycosis.....	527, 769
Amaurosis Consecutive to Extraction of a Tooth	875	Certain Dental Disorders Caused by a Diet Exclusively Lactéal.....	91
Artificial Induction of Phagocytosis in the Treatment of Infection.....	1101	Certain Reflex Ocular Disturbances of Dental Origin	1308
Artificial Larynxes	877	Certain Special Forms of Necrosis of the Maxillæ	319
Blackening of the Tongue Caused by		Cocainization of the Inferior Dental Nerve for the Painless Extraction of Mandibular Teeth	321
		Composition of Platinoid.....	1104

Congenital Fistulæ of the Lower Lip...	209	Maxillary Sinus Empyema in the New-born	644
Contribution to the Etiology of Tooth-Gemination	879	Mercurial Stomatitis: Present Status of the Question.....	1206
Contribution to the Study of Syphilitic Facial Neuralgia	1103	Mouth-Disinfection	415
Dental Caries During Pregnancy.....	1104	New Method of Treating Pericementitis by Means of Local Injections of Sodium Salicylate	414
Dental Ectopy and Nasal Suppuration..	413	Nutrition a Factor in Tooth-Development	1310
Dentifrices	528	Partial Denture (A) Lodged in the Esophagus	1000
Difficult Eruption of a Permanent Canine	772	Pathology and Treatment of Tumors of the Jaws	1099
Disturbances Accompanying the Difficult Eruption of the First Molar.....	1206	Perforations of the Soft Palate in Scarlet Fever	771
Double Resection of the Mandible.....	1002	Points on the Treatment of Stomatitis..	412
Eczema of the Lip, and the Rôle of Certain Mouth-washes in Its Etiology..	321	Porcelain Tip (A).....	209
Epithelioma of the Lip Cured by Roentgen Rays	1003	Presence of Teeth at Birth.....	1104
Erythrophlein Chlorid and Its Uses in Dentistry	1003	Preservation of Deep Sensitivity of the Face After Destruction of the Fifth Nerve	876
Erythrophlein Hydrochlorid in the Treatment of the Deciduous Teeth...	89	Prevention (The) of Rusting by Means of Gum-Resin Euphorbium	640
Extensive Perforation of the Soft Palate Cured by Medicinal Means.....	770	Proteol in the Treatment of Infected Root-canals	1312
Facial Neuralgia Caused by Irritation of the Pulp through Mechanical Abrasion	1002	Pseudo-Odontalgia of Grippal Origin....	999
Follicular Cyst of the Mandible.....	1101	Rare Complication (A) of Pyorrhea Alveolaris	320
Fracture of the Lower Jaw Across the Neck of Both Condyles.....	644	Recurrent Bullous Stomatitis.....	639
Futility and Danger of Treating Cocain Poisoning with Morphin.....	413	Replantation	528
Gangrene of the Mouth (Canerum Oris): Its Cause, Evolution, and Treatment by Means of Methylene Blue	1311	Resection of the Apex	1313
Glass Solder	412	Resorption of the Roots of a Molar in the Course of Senile Alveolar Atrophy	771
Hyperesthesia of the Buccal Mucous Membrane	1000	Review of the "Manual on the Art of the Dentist" by Jourdan and Maggiolo...	525
Infantile Scurvy: Its Manifestations and Diagnosis	768	Separation of Platinum, Gold, and Silver, from a Mixture of Laboratory Filings	411
Influence (The) of Systemic Conditions on Certain Serious Complications of Dental Caries	210	Severe Hemorrhage Following the Extraction of a Lower Molar.....	524
Injections of Fresh Serum in Hemorrhagic Conditions	641	Some Notes on the Relation of Dental Conditions to Pulmonary Tuberculosis	92
Interesting Case of Congenital Malformation of the Mouth.....	210	Some Observations on the Bacteriology of Pyorrhea Alveolaris.....	878
Interesting Case of Fracture of the Mandible	91	Some Obstacles in Crown and Bridge Work	1205
Intradental Anesthesia by Means of Extradental Injections of Cocain Adrenalin	322	Some Practical Points in Orthodontia for the General Practitioner.....	1203
Inverted Mandibular Third Molar (An)	1102	Some Useful Remedies.....	208
Investigations on the Effect of High Temperature on Teeth.....	876	Spurious Hemoptysis	641
Iothion	1102	Sterilization of Root-canal Instruments.	644
		Sublingual Leucokeratosis	208
		Syphilitic Lesion of the Temporo-mandibular Articulation	414

Therapeutic Notes	772	Treatment of Accidents of Anesthesia..	1099
Therapeutic Significance of the Silver Salts	879	Treatment of Dental Hemorrhage.....	1202
Three Cases of Severe Infection of Dental Origin	640	Treatment of Fistula of Dental Origin by Means of Injections of Tincture of Iodin	1003
Three Cases of Systemic Infection of Dental Origin	1098	Tuberculosis of the Mucous Membrane of the Mouth.....	527
Tic of the Muscles of Mastication Appearing in the Course of an Alveolo-dental Periostitis	644	Two Cases of Alopecia Confirmatory of Jacquet's Theory	877
Treatment of Acute and Chronic Suppurations with Carbolic Acid in Combination with Gum Camphor.....	90	Variations in Size of the Maxillary Sinus	643
		Work (The) of Joseph Audibrant.....	322

PERISCOPE.

Action of Tobacco upon the Teeth....	773	Carrying Arsenic to Cavity, Avoiding the Use of Pressure.....	1004
Active Germicidal Properties of Carbolic Acid	1315	Cases in Which Gold Inlays are Particularly Indicated	1108
Adaptation of Cement to Cavity Walls.	648	Cast Gold Inlays and Tips.....	775
Aid (An) in the Removal of Difficult Impressions	773	Cavities for which Gold Inlays are Indicated	1008
Aluminum Washers	416	Cavity Preparation and Formation of Matrices for Porcelain Inlays.....	1215
Amalgam in Posterior Teeth.....	1105	Cavity Preparation for Inlays Subject to Stress	418
Amalgam Manipulation	1105	Cementing Arsenic	95
Amalgam Restorations Better than Gold Crowns	530	Cement in Combination with Absorbent Cotton as a Sealing Dressing.....	880
Amputation of Dead Roots of Molars in the Preparation of Bridge Abutments.	1107	Cement Line (The) of Inlays: Permanence Dependent upon Minimum Thickness	418
Anchorage Pins for Large Porcelain Restorations	1214	Chloroform Water as a Hemostatic... ..	416
Anchoring of Gold Inlays in Occlusal Surface	1210	Cleaning Files	95
Annealing Platinum	1210	Cleaning Impression Trays.....	773
Application of Silver Nitrate	417	Common-Sense Treatment of Pyorrhea Alveolaris	1213
Appropriate Filling Materials for Nervous Patients	883	Comparative Value of Porcelain and Gold Inlays	646
Argyrol for Pus-Pockets.....	645	Comparison (A) of the Properties of Novocain and Alynin with Those of Cocain	327
Attaching Facings to Caps with Porcelain	325	Consideration of Some of the Factors Which Contribute to Success in Abdominal Operations	1314
Bandless Richmond Crown (A).....	882	Contraction and Expansion of Plaster of Paris	419
Bent-Wire Clasps	97	Controlling a Hypersensitive Palate when Taking Impressions.....	213
Best Clasp for Partial Plates.....	645	Convenience (A) in Running a Cast....	1212
Burnished Joint for Porcelain Crowns..	883	Crown (A) Whose Band Remains Invisible	646
Burnishing Gold Plate to a Tooth.....	1106	Cusps for Bridge Teeth.....	212
Calcium Chlorid as a Hemostatic.....	529	Cutting Out Fissures.....	1006
Carbolic Acid Antidote.....	1211		
Careful Application of the Forceps to Avoid Serious Mishaps.....	214		
Care in the Use of Silver Nitrate.....	417		
Care of Nickel-plated Parts.....	645		
Care of Retaining Appliances.....	1210		
Care of the Handpiece.....	773		
Care of the Plate After Vulcanizing: Avoid Rapid Cooling.....	530		

Death Caused by the Swallowing of an Artificial Denture	325	How to Avoid Chopping up Crystal Gold	645
Dental Vital Statistics	882	How to Clean a Cement Slab	880
Details Essential in Taking Impressions of the Mouth	649	How to Determine the Direction of the Condyle's Path	99
Devitalizing Pulpas	96	How to Give a Glossy Surface to Plaster Casts	774
Diatoric Teeth in Bridge Work	1213	How to Make a Fusible Metal Impression of a Single Tooth	1005
Die Metal for Modeling Compound Impressions	1004	How to Obtain a Correct Bite	1008
Displaced Tooth (A) in the Nasal Cavity Causing Fetid Vomiting	883	How to Take an Impression of a Soft and Flabby Mouth	98
Effective Ligature (An)	1105	How to Trim and Sterilize Cotton	1313
Electric Sleep	1215	Hydronaphthol as a Pulp-capping	416
Evil Results of the Air-Chamber	1212	Ichthyol in the Treatment of Pericemental Abscess	529
Expansion of Plaster-of-Paris Casts and Its Compensation by the Contraction of Zinc Dies	327	Identification by the Shape of the Palate	774
Extraction of Abscessed Teeth	1211	Important Physiological Requirement (An) in Pulp-capping	325
Factors to be Considered in the Selection of Filling Materials	880	Impression for Gold Inlay	774
Failure Resulting Through Anchoring a Bridge in a Gold or Amalgam Filling at Each End	1107	Influence of Defective Nasal Breathing on Growth and Development	531
Failures in Crown and Bridge Work Resulting from Faulty Technique	1108	Inlays, Gold and Porcelain, and Where to Use Them	1315
Few Facts (A) in Connection with Root-canal Treatment: Therapeutic Value of Creasote	1008	Investing Crowns and Bridges	326
Few Ideas (A) on "Taking the Bite,"	213, 1106	Investment Plaster	1005
Flux for Soft Soldering	1210	Iodin as a Germicide	213
Formula for Pharyngitis and Aphthous Stomatitis	773	Joints	1008
Frequency of Caries and Its Relation to the Quality of Bread Used	214	Liquid Preparation of Iodoform	214
General Rules for the Preparation of Cavities for Gold Inlays	646	Little Helps	214
Glycerin and Rose-water	325	Local Anesthesia in Dental Operations	1315
Gold Corner (A) on a Porcelain Facing	325	Locating the Irritating Portion of a Plate	529
Gold Fillings in Children's Teeth Made Easy	1105	Manipulation of Amalgam: Introduction and Packing	1314
Gold Inlay "Don'ts"	1106	Method for Making Gold Inlays without a Matrix	649
Gold Inlays, and a Few Principles of Cavity Preparation Therefor	1005	Method of Adapting Matrix to Cavity	650
Gutta-percha for Filling Teeth	1005	Method of Adjusting a Logan Crown	1109
Hard Mucous Surfaces: How to Modify Them in the Impression	97	Method of Dividing Plaster Impressions before Removal from the Mouth	1107
Hastening the Solution of Gutta-percha in Chloroform	416	Method of Forming Cusps for Perfect Occlusion in Bridge Work	1006
Helpful Hint (A)	773	Method of Handling and Sterilizing Root-canal Broaches	417
Hints to Avoid Wrongly Placing the Cast on the Articulator	212	Method of Inserting Crystal Gold in Combination with Foil Gold	95
Hints to the Student and the Young Practitioner on Impression-Taking	1004	Method of Making a Gold Inlay	647
		Method of Making Impressions for Full Dentures by the Use of Modeling Compound and Plaster	775
		Method of Mixing Cement	419
		Method of Obtaining Stability of Upper Plates Without the Use of Air-chambers	1005

Method of Obtaining Sticks of "Sticky-wax" by Casting in Glass Tubes.....	530	Prescription for Obtunding Sensitive Dentin	328
Method of Tipping Facings with Gold..	773	Preservation of Cement.....	645
Method of Using Inlay Gold in Making an Open-face Crown.....	1007	Prevention of Air-spaces in Vulcanized Rubber	96
Methods and Equipment for Bedside Dental Treatment	99	Prevention of Expansion of Plaster.....	416
Methods of Anesthetizing the Pulp.....	1006	Prosthetic Hints	326
Methods of Diagnosis: The Exploring Needle and the X Ray.....	97	Prosthetic Suggestions	1213
Misconceptions Concerning Porcelain: Don't Jar the Body.....	1006	Protecting Porcelain Surfaces for Solder Work	95
Mixing (The) of Amalgam.....	96	Protection for the Dentist Against Specific Infection	1007
Mixing (The) of Zinc Oxyphosphate Cement	214	Protection of Porcelain During Soldering	1105
Monochromatic and Polychromatic Inlays	1315	Pulmonary Abscess Caused by a Tooth..	98
Mouth-wash for Diabetics.....	1314	Putrescent Pulp	416, 1105
Mouth-wash for Syphilitic Ulcers.....	529	Quick Filter	1313
Mouth-wash for Thrush in Infants.....	529	Radium Emanation and Transmutation of Elements	1216
Mouth-wash in Pyorrhea Alveolaris....	530	Re-baking an Inlay.....	1211
Necessity (The) for Dental Services in Public Institutions	325	Reduction of Pain Incident to the Removal of Calculi.....	212
Notes on Lactic Acid in Root-canal Treatment	648	Relation of Art and Science in Dentistry	1108
Objection to Immediate Root-filling....	645	Reliability of Amalgam.....	327
Obtaining Plaster Impression Without the Use of Trays.....	532	Relief from Toothache.....	774
Obtunding Sensitive Dentin in Gingival Cavities	881	Remaking a Plate Without a New Impression	529
Odd Cases in Dental Pathology.....	647	Remedy for Canker Sore Mouth.....	645
Ointment for Neuralgia.....	1314	Removal of a Broken Gates-Glidden Drill	96
Opening Flasks	325	Removal of Black Stains from the Skin Caused by Silver Nitrate.....	1313
Origin of "Doctor".....	212	Repairing Gold Fillings.....	1106
Packing and Finishing of Cement Fillings	326	Replacing Tooth on Temporary Plate...	880
Pain After Tooth-Extraction.....	325	Right Light (The) in the Operating Room	1314
Perfectly Swaged Cusps.....	212	Root-canal Filling	646
Perfuming of Vaseline.....	1211	Rusting of Iron.....	529
Perhydrol (Hydrogen Dioxid) in Dental Hyperesthesia	97	Salivation	1105
Plaster and Sand Investment.....	1313	Selection of Filling Material for and Treatment of Children's Teeth.....	881
Pointers on Porcelain Inlays.....	529	Selection of Lower Impression Trays..	1004
Polishing Plates	95	Separation of Incisors	1314
Porcelain Catechism (A)	881	Sequel (The) of Inlays.....	1211
Practical Thoughts on Impression-Taking	95	Setting a Shell Crown.....	1005
Precaution (A) Before Operating.....	645	Setting Crowns and Bridges with Gutta-percha Cement	326
Precautions in Soldering.....	1109	Sharpening Files	1106
Preparation of Amalgam for a Filling..	881	Simple Method of Making a Gold Inlay..	1106
Preparation of Cavities.....	1105	Soap as an Antiseptic.....	1105
Preparation of the Mouth for an Impression: Extraction	774	Soldering Clamp	212
Preparatory Work in Artificial Dentures	1107	Soldering Flux	1004
Preparing Sensitive Cavities.....	212	Some Pointers on the Manipulation of Plaster of Paris.....	1315
		Splints for the Anterior Lower Teeth..	327
		Sterilization of Dentures.....	95

Sterilization of Engine Handpieces.....	416	Treatment to Relieve the Sensitivity of Shallow Erosion Cavities.....	648
Sterilization of Polishing and Grinding Stones	773	Use of Cement for Swaging Gold Inlay Matrices	1004
Strength of Tincture of Aconite.....	212	Use of Flexible Rubber in the Retention of Artificial Dentures.....	648
Successful Partial Lower Dentures.....	419	Use of Floss Silk in Placing Clamp....	1004
Suggestions Concerning the Preservation of Children's Teeth.....	1212	Use of Silver Nitrate Under Cement Fillings	645
Technique of Amalgam Restorations....	328	Use of Tannin in Painful Tooth-Affections	1314
Temperature at which Gold Boils.....	647	Wedging Preparatory to the Extraction of an Impacted Lower Third Molar Lying Against the Second Molar: A Case from Practice.....	774
Therapeutics of Pyorrhea Alveolaris....	775	What Gold Foil Annealing Really Is: The Advantages of the Electric Annealer	532
Therapeutic Value (The) of Mastication	97	When Shall We Devitalize the Pulp of Teeth to be Crowned.....	1107
Three Useful Pointers.....	416	Why and How Deciduous Teeth Should be Preserved.....	1004
Thymocamphene	880	Word of Warning in Desensitizing Dentin	1211
Thymol-Camphor	1214		
Tightening Screw Connections.....	1210		
Tooth-Powders	531		
Treating an Alveolar Abscess through the Alveolar Process.....	95		
Treatment for Sensitive Cavities.....	213		
Treatment of Sensitive Cavities with Carbolic Acid and Sodium Dioxid....	99		
Treatment of Sensitive Cervical Margins	325		
Treatment of the Gum with Chloro-percha Before Setting a Crown....	1212		

HINTS, QUERIES, AND COMMENTS.

Calcium Chlorid as a Hemostatic in Hemorrhage	1009	Method of Resetting a Bridge Without Removing It from the Mouth where One of the Anchorage Points has Become Loosened	215
Devitalizing Paste	1216	Preparation of Matrix for Cavities Extending Under the Gum.....	533
Guthymol	1216	Removable Posts	100
How to Secure Dryness in Labial Cavities	533	Repairing Porcelain Facings.....	329
Interesting Case (An) in Practice.....	534	Use of Hypodermic Syringe in High-pressure Anesthesia	1009
Making Gold Bands, Caps, and Crowns Without Solder	884		
Method of Replacing a Facing on an Anterior Bridge	533		

OBITUARY.

Bacon, Elbridge	651	Goodwillie, James	651
Beck, C. S., "In Memoriam" Resolutions	101	Harper, H. D.....	101
Betts, Ralph N.....	217	Hart, John L.....	885, 1218
Billmeyer, U. D.....	217	Laroche, William Tell.....	421
Bradley, Frederick	1316	Leonard, George R., "In Memoriam" Resolutions	778
Brewster, Richard C., "In Memoriam" Resolutions	1218	Lesster, L. L., "In Memoriam" Resolutions	778
Dennis, Samuel William.....	651	Littig, J. Bond.....	776, 1218
Flower, James Oliver.....	217	McDougall, Samuel J.....	535
Foster, Sir Michael.....	329	Marvin, Cornelius A.....	777
Geer, Sidney L.....	420	Miller, Professor W. D.....	1009, 1014, 1110
		Moore, J. Hall.....	534

Nellis, Francis D.....	216	Taylor, C. R., "In Memoriam" Resolu-	
Parker, Horace	1217	tions	101
Perkins, Joseph L.....	216	Tripp, Jerome Plummer.....	421
Roberts, G. Arthur.....	652	Ward, Sullivan Lawrence.....	1217
Skidmore, Luther W.....	420	Williams, Jacob Lafayette.....	421
Stevens, Alonzo H.....	535	Wilson, Henry Donald.....	1110
Strickland, Isaac	1218	Winkle, A. F.....	652

DENTAL LEGISLATION.

New Dental Law for Pennsylvania	653
---------------------------------------	-----

DENTAL COLLEGE COMMENCEMENTS.

Atlanta Dental College.....	1111	Pennsylvania College of Dental Surgery	780
Baltimore College of Dental Surgery...	659	Philadelphia Dental College.....	890
Baltimore Medical College, Dental De-		Pittsburg Dental College.....	783
partment	779	Royal College of Dental Surgeons of	
Barnes University, Dental Department.	657	Ontario	779
Chicago College of Dental Surgery.....	887	St. Louis Dental College.....	660
Cincinnati College of Dental Surgery...	888	Southern Dental College.....	658
College of Oral and Dental Surgery of		State Dental College, Texas.....	660
New York	782	State University of Iowa, College of	
College of Physicians and Surgeons, Den-		Dentistry	1111
tal Department	889	Tufts College Dental School.....	891
Colorado College of Dental Surgery....	658	University College of Medicine, Depart-	
Creighton University.....	784	ment of Dentistry.....	779
Detroit College of Medicine, Dental De-		University of Buffalo, Department of	
partment	887	Dentistry	780
Georgetown University, Dental Depart-		University of California, Dental Depart-	
ment	891	ment	894
Harvard Dental School.....	893	University of Illinois, College of Den-	
Howard University, Dental Department	888	tistry	889
Indiana Dental College.....	657	University of Maryland, Dental Depart-	
Kansas City Dental College.....	656	ment	890
Keokuk Dental College.....	658	University of Michigan, College of Den-	
Marquette University, Department of		tal Surgery	892
Dentistry	659	University of Minnesota, College of Den-	
Medical College of Virginia, Dental De-		tistry	893
partment	659	University of Pennsylvania, Dental De-	
Medico-Chirurgical College, Dental De-		partment	781
partment	783	University of Southern California, Den-	
Meharry Dental College.....	656	tal Department.....	886
New Orleans College of Dentistry.....	889	Vanderbilt University, Department of	
New York College of Dentistry.....	782	Dentistry	888
North Pacific Dental College.....	784	Washington University, Dental Depart-	
Northwestern University Dental School.	892	ment	784
Ohio College of Dental Surgery.....	886	Western Dental College.....	656
Ohio Medical University, Dental Depart-		Western Reserve University, Dental	
ment	657	School	893

DENTAL SOCIETY NOTES AND ANNOUNCEMENTS.

Alabama Board of Dental Examiners...	431	International Association of Stoma-	
Alabama Dental Association.....	428	tology	1219
Alumni Association of Chicago College		International Dental Federation.....	423
of Dental Surgery.....	105	Interstate Dental Fraternity.....	785
American Dental Society of Europe, 105,	1317	Iowa Board of Dental Examiners,	
American Medical Association—Section		107, 432, 1223	
on Stomatology	541	Iowa State Dental Society.....	428
American Society of Orthodontists.....	332	Jamestown Dental Convention,	
Angle School of Orthodontia Alumni So-		102, 538, 791, 900, 1015	
cietiy	1113	Kansas Board of Dental Examiners....	549
Arizona Board of Dental Examiners 336,	1023	Kentucky Board of Dental Examiners,	
Arkansas Board of Dental Examiners..	224	551, 1223	
Arkansas State Dental Association....	222	Kentucky State Dental Association....	223
Army Dental Corps,		Lake Erie Dental Association.....	334
106, 430, 676, 798, 907, 1113, 1224,	1320	Los Angeles Association of Dental	
Banquet to Dr. G. V. Black.....	104	Alumni	430
Boston and Tufts Dental Alumni Asso-		Maine Board of Dental Examiners.....	675
ciation	1113	Maine Dental Society.....	672, 1024
California Board of Dental Examiners,		Maryland Board of Dental Examiners,	
224, 336		431, 1114	
Call for an International Mass Meeting		Massachusetts Board of Registration, 224,	1116
of Dentists	105	Massachusetts Dental Society.....	429
Chicago College of Dental Surgery		Michigan Board of Dental Examiners...	548
Alumni Association	1318	Michigan State Dental Association....	547
Chicago Odontographic Society.....	430	Minnesota Board of Dental Examiners,	
Colorado Board of Dental Examiners... 1116		224, 551, 1115	
Colorado State Dental Society.....	429	Mississippi Dental Association....	428, 894
Connecticut Dental Commissioners..431, 1115		Missouri State Dental Association	548
Connecticut State Dental Association,		Montana State Dental Society.....	222
106, 426, 672		National Association of Dental Exam-	
Dental Society of the State of New York,		iners	222, 1113
222, 427		National Association of Dental Facul-	
Detroit Dental College Alumni Clinic		ties	426
and Banquet	544	National Association of Physicians,	
Detroit Dental Society.....	222	Pharmacists, and Dentists.....	895
District of Columbia Board of Dental		National Dental Association,	
Examiners	107, 552, 1320	424, 541, 787, 1024	
Eastern Indiana Dental Association....	427	N. D. A. Committee on the History of	
Fifth District (N. Y.) Dental Society..	426	Dentistry	107
First Australian Dental Congress.....	332	Nebraska Board of Dental Examiners,	
First French Congress of Stomatology..	332	336, 1116	
Florida Board of Dental Examiners....	550	Nebraska State Dental Society.....	545
Florida State Dental Society.....	548	New Hampshire Board of Registration,	
Georgia State Dental Society.....	333	432, 1115	
G. V. Black Dental Club of St. Paul, 103, 1318		New Hampshire Dental Society.....	430
Idaho Board of Dental Examiners.....	1223	New Jersey Board of Registration....	1115
Illinois Board of Dental Examiners. 549, 1022		New Jersey State Dental Society... 335, 1114	
Illinois State Dental Society.....	427, 799	New York College of Dentistry—Notice	
Indiana Board of Dental Examiners. 106, 432		to Alumni	1318
Indiana State Dental Association.....	335	New York Odontological Society.....	430
Institute of Dental Pedagogics....	1221, 1317	New York State Dental Society....	222, 427

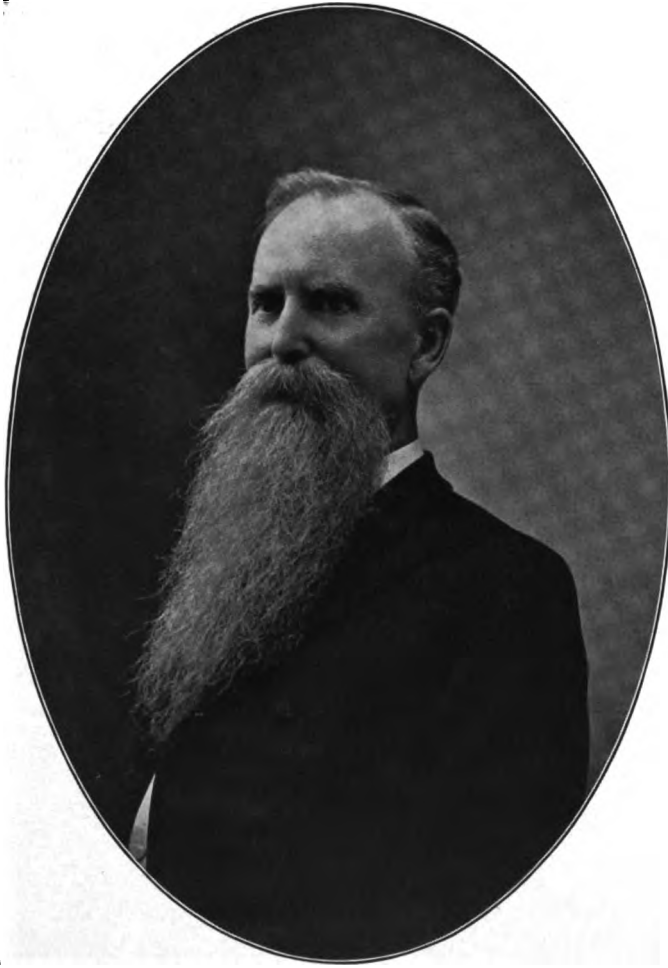
North Carolina Board of Dental Examiners	550	Sixth District (N. Y.) Dental Society..	546
North Carolina Dental Society.....	671	South Carolina Board of Dental Examiners	552
North Dakota Dental Association.....	799	South Carolina State Dental Association	797
Northeastern Dental Association.....	798	South Dakota Board of Dental Examiners	107, 550, 1320
Northern Illinois Dental Society.....	1114	South Dakota Dental Society.....	335, 547
Northern Iowa Dental Society.....	907	Southern California Dental Association.	106
Northwestern University Dental School—Clinic	1318	Southern Nebraska Dental Society.....	105
Odontotechnique Society of New Jersey, 333, 546,	1318	Southern Wisconsin Dental Association, 426,	799
Ohio Board of Dental Examiners..	550, 1222	Susquehanna Dental Association of Pennsylvania	546
Ohio State Dental Society.....	105, 1221	Tennessee Board of Dental Examiners.	549
Ontario Dental Society.....	106	Tennessee State Dental Association, 335, 548,	672
Oregon State Dental Association.....	333	Texas Board of Dental Examiners..	336, 1223
Pennsylvania Board of Dental Examiners	674, 1319	Texas State Dental Association.....	429
Pennsylvania College of Dental Surgery.	105	Third, Fourth, and Fifth District (N. Y.) Dental Societies.....	1022
Pennsylvania State Dental Society....	548	University of Pennsylvania Dental Alumni Society	543
Philadelphia Dental College Alumni Society	544	University of Pennsylvania, Dental Department, Class of 1902.....	544
Prize Offered by Rotterdam Dental Society	662	Utah State Dental Society.....	671
Psi Omega Fraternity.....	785	Vermont Board of Dental Examiners..	552
Public Dental Library for the City of Columbus, Ohio	106	Vermont State Dental Society.....	223, 799
Randolph (Mo.) Dental Society.....	672	Virginia Board of Dental Examiners...	549
Rhode Island Board of Registration, 335, 675,	1114	Virginia State Dental Association....	672
St. Louis Dental College Alumni Clinic.	428	Washington University, Dental Department—Meeting of Alumni.....	334
St. Louis Society of Dental Science....	223	West Virginia Board of Dental Examiners	432
San Francisco Dental Relief Committee—Report	632	Wisconsin Board of Dental Examiners, 107,	550
San Francisco Dental Society.....	223	Wyoming Board of Dental Examiners..	675
Second District (N. Y.) Dental Society.	799		
Seventh District (N. Y.) Dental Society	333		

Monthly Record of Patents Relating to Dentistry.

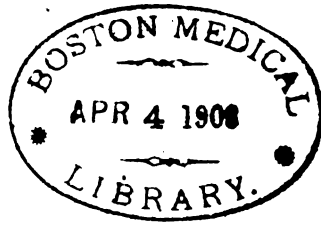
PATENTS	108, 224, 336, 432, 552, 676, 800, 908, 1024, 1116, 1224, 1320
---------------	--

INDEX.

INDEX TO VOLUME XLIX.....	1321
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DR. H. D. HARPER.



THE
DENTAL COSMOS.

VOL. XLIX.

JANUARY 1907.

No. 1.

ORIGINAL COMMUNICATIONS.

EXPERIMENTS AND OBSERVATIONS ON THE WASTING OF
TOOTH TISSUE VARIOUSLY DESIGNATED AS EROSION,
ABRASION, CHEMICAL ABRASION,
DENUDATION, ETC.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Ger.

(I.)

SOME confusion has been occasioned by reason of the fact that various authors on the subject specified under the above title have given the affection different names according to their own conception of its nature, the result being to a certain extent the same as in the case of pyorrhea alveolaris, viz, that we have a multiplicity of names no one of which is fitted to all of the conditions and phenomena present.

In particular, the use of the word "erosion" (Lat. *e* + *rodere*, to wear off, to eat away, to consume, to corrode) has given rise to considerable confusion. It has been employed by many to designate a wearing away by mechanical means only, and undoubtedly this meaning is inherent in the word; in fact, we

get the term "rodent" (gnawer) from the same root. More commonly, however, and especially in pathology, we understand by erosion a superficial loss of substance caused by the solvent or corroding action of some fluid—as, for instance, the hemorrhagic erosion of the mucous membrane of the stomach; and in this sense it is always employed to designate an *acquired* lesion, whereas in dentistry the French and many other continental writers employ it—improperly, it seems to me—to designate an *hereditary* condition of the teeth for which Zsigmondy has recommended the very appropriate term hypoplasia (Gk. *hypo*, under, and *plassein*, to build), i.e. faulty development.

I am not an advocate of making new

names, nor do I believe that it is good policy to "swap horses while crossing the stream." I have therefore heretofore adhered to the old nomenclature. Recently, however, I have been repeatedly admonished of the fact that especially European readers are likely to be misled by the use of the term erosion. Accordingly, in order to guard against any misunderstanding, I give the following definitions of the terms to be used in this communication:

Wasting (wasting away, wearing away) is used in a collective sense to designate any kind of slow and gradual loss of tooth-substance characterized by a smooth, polished surface, without reference to the cause of such loss.

Erosion (*e + rodere*, to eat away) refers to the superficial chemical disintegration of tooth-substance.

Abrasion (*ab + radere*, to rub off) is a slow and gradual wasting away of tooth tissue by friction.

Attrition (*atterere*, to rub upon or against, to wear away by rubbing together) designates the particular condition in which abrasion is produced by the rubbing of teeth upon each other in mastication, etc.

Denudation is used in the ordinary sense of laying bare or divesting of a protecting covering.

Wedge-shaped defect is equivalent to the "keilförmiger Defekt" of German authors: a wasting away of the tooth at the neck, very often taking a form as though produced by a three-cornered file.

Hypoplasia (Gk. *hypo*, under, + *plasia*, to build)—faulty development—indicates the hereditary condition of the teeth which English and American authors have described by the terms pitted, grooved, honeycombed, atrophied, etc., and French and many other continental authors by the term "erosion."

Wasting produced by mechanical agents is equivalent to "abrasion;" by chemical agents, to "erosion;" by mechanical and chemical agents combined, to "chemico-abrasion."

There is scarcely a question in dental

pathology which has so stubbornly resisted all attempts at a satisfactory conclusive solution as that of the wasting of the teeth, and it is therefore not surprising that a great many different theories have been promulgated regarding it.

It would be beyond the limits set for this paper if we were to attempt to analyze all those theories; besides, it will suffice for our present purpose simply to call attention to them. At the same time I will beg those who are interested in this question to consult my communication printed in this journal for March 1904, of which this may be considered a continuation.

Among the various causes that have been put forward to account for the wasting of the teeth, the following may be mentioned:

(1) Mechanical agents, in particular the tooth-brush (John Tomes, Zsigmondy Sr., Zsigmondy Jr., Salter, Niemeyer, Billeter, Zinkler, Von Metnitz, Parreidt, etc.). Parreidt believes, however, that the brush does not act upon the teeth unless they are in some way predisposed.

(2) Mechanical agents in the presence of alkalies or acids. (Jul. Scheff.)

(3) Resorption. (Linderer.)

(4) Chronic caries. (Leber and Rotenstein.)

(5) Friction of folds of the mucous membrane. (Wedl.)

(6) Exfoliation. (Baume.)

(7) Alkalies. (Baume.)

(8) Acids. (Frey, Darby, Snyder.)

(9) Acid secretion of the mucous membrane. (Hagelberg, Coleman, Truman, Kirk, Burchard, and others.)

(10) Acids in combination with mechanical agents. (Schlenker, Walkhoff, M. Bastyr.)

(11) Agents which attack the organic matter of the tooth. (Znamensky, Michaels, Preiswerk, A. Bastyr.)

(12) Electrolytic action. (Bridgman, Garretson.)

(13) Defective development. (Bland-Sutton.)

This list makes no pretense to being complete. Any student of the question

can easily add names under the different headings.

The most recent and detailed communication on the subject of erosion is by Alfred Bastyr: "Der erworbene Defekt der harten Zahnschubstanzen," in Scheff's "Handbuch der Zahnheilkunde," vol. ii, part 1. From this communication I have taken many of the above data referring to the literature of the subject.

Bastyr comes to the conclusion that *acids, or in general agents which dissolve the calcium salts of the teeth, can never produce wedge-shaped defects*. In all such cases only decay at the neck of the tooth is the result. This is a confirmation of a point brought out by me in this journal for March 1904, though we shall see that there are many modifying influences and conditions to be taken into consideration. Bastyr is of the opinion that in the majority of cases of wedge-shaped defects some substance acting in connection with mechanical agents dissolves or diminishes the organic matter of the tooth. But what this substance is, Bastyr is not able to say, inasmuch as he did not succeed in extracting the organic matter of the tooth by chemical processes.

In my studies on the wasting of the teeth I have found it convenient to concentrate my attention upon the following points:

- (1) The action of mechanical agents in the production of wasting.
- (2) The action of substances which attack the inorganic constituents of the teeth (acids or acid salts).
- (3) The action of (1) and (2) combined.
- (4) The action of substances which attack the organic matter of the tooth.
- (5) The action of (1) and (4) combined.
- (6) The action of (2) and (4) alternating.
- (7) The action of bacterial ferments.
- (8) The action of electric currents in the mouth.

Furthermore, the question of the relation of gout and rheumatism to, and the causal connection of potassium sul-

focyanid with, wasting of the teeth have received especial attention.

I. ACTION OF MECHANICAL AGENTS IN THE PRODUCTION OF WASTING.

There has not been for years any doubt in my mind that most cases of wasting observed in our practices are due to mechanical action—which means in particular the action of the tooth-brush combined with tooth-powder.

This conviction has been confirmed by observations made during the last few months. Let me refer to a few of these cases in order to substantiate the view just expressed, or to furnish my readers with the opportunity of checking me if the above conviction appears to them not to be well founded.

Case 1 (for which I am indebted to Dr. Griswold of Hamburg). Male, age fifty: in good health except for a tendency to gout after too much wine. Teeth strong and yellowish. Saliva alkaline, mucus at one time alkaline, at another slightly acid. *The incisors, which are prominent, show no wear at all, whereas the canines and bicuspid's above and below are completely worn away as shown in Fig. 1. The upper left canine was devitalized and filled in November 1901: gutta-percha, cement, and gold succeeding each other.*

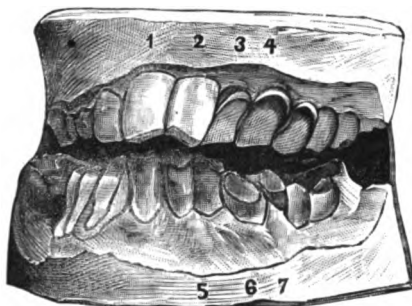
The wearing away, which began at the cusp, had involved the whole of the labial surface and exposed the root-canal in December 1905, the dentin, gutta-percha, cement, and gold presenting a continuous smooth surface. The lower first bicuspid was crowned with gold in February 1904. In December 1905 the crown was completely worn through on the buccal surface. The patient demonstrated his method of brushing to Dr. Griswold, confirming the suspicion that he brushed only the sides of his denture, the short upper lip and projecting incisors preventing his getting the brush between the incisors and the lip.

The patient employed a much-used English tooth-paste for over twenty years. It contains a surprising amount of a gritty substance, the hasty washing of one box of the paste yielding over two thimblefuls of grit which seems to consist chiefly of pumice. A microphotograph of this grit is shown in Fig. 2.

Case 2. Male, age sixty-five, of rheumatic diathesis. Saliva abundant, thin, without foam, moderately cloudy, little sediment; re-

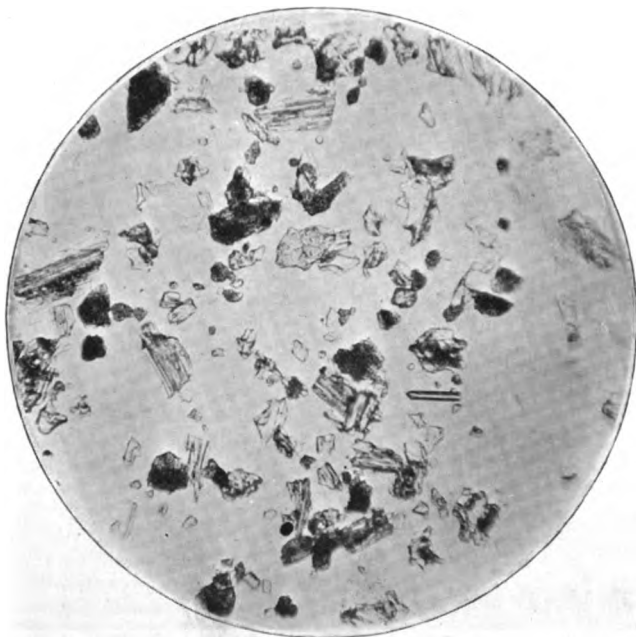
action slightly alkaline; reaction of mucus slightly under normal. sulfocyanids slightly amphoteric. Nessler's reagent gave abundant above normal, phosphates abundant, chiefly

FIG. 1.



Severe wasting of canines and bicuspid produced by the employment (for over twenty years) of a much-used English tooth-paste. (Incisors free from abrasion.) At 7, abrasion of gold crown by action of tooth-brush and paste.

FIG. 2.



Photomicrograph of sediment obtained by washing tooth-paste referred to under Fig. 1.

precipitate (which by the way, does not necessarily indicate ammonia). Chlorids soluble phosphates of sodium and potassium. The front teeth, and to a less extent

the bicuspid, were almost completely denuded of their enamel. In the lower jaw the destruction was not quite so extensive, being more pronounced at the necks.

This man also used the same preparation for about twenty years. He was inclined to the view, however, that the paste was not the cause of the wasting, since his wife, he said, also used it without any bad result to the teeth. On closer inquiry it turned out that his wife had used the paste only half as long as he had. On a subsequent occasion the opportunity was given me of examining the teeth of his wife, when I found that she also had pronounced wasting, beginning at the necks of the teeth and extending more or less upon the enamel. Three of the defects had already been filled with gold.

Case 3. Physician, age forty-seven; arthritis of the knee joint. No gout so far as he is aware. The saliva was not examined. The front teeth were badly wasted on the labial surface. The patient dates the beginning of the trouble from the time he commenced using an English tooth-paste which consists of prepared chalk along with a small amount of pumice. He enjoys looking at his beautifully white teeth and brushes them excessively, so that his wife frequently laughs at him on account of the time spent over them.

Case 4. Woman, age forty-five, in perfect health; denies all suspicion of gout, rheumatism, or any other malady. Saliva normal in quantity and character. The upper centrals are worn away from the cutting edge, and these edges slope up toward the distal margin, permitting the brush to strike with full force against the mesial angle of the lateral, which is accordingly worn away on both teeth. Other teeth above and below are also extensively wasted. A gold filling at the neck of the first bicuspid is badly worn, and a gold crown on the second bicuspid shows distinct wearing of the gold band at the margin of the porcelain. *Gold crowns on M 1, both above and below on left side, are worn through on the buccal surface.* Her tooth-powder has an exceedingly gritty feeling when held between the fingers, and contains a large percentage of pumice and another undetermined insoluble grit, and *her tooth-brush wears down rapidly.*

Case 5. Woman, age forty-eight; rheumatic, and in moderate degree diabetic. Salivary secretion abnormally slight, saliva foamy, liquid, alkaline. Mucus of lower lip alkaline, of upper lip amphoteric. Up to two years ago she used a sharp tooth-powder.

but then changed to one without grit, and began brushing vertically. She claims that the wearing has made no progress since the change was made, which is apparently the case, as the surfaces are in no case highly polished, but rather dull, and partly discolored by a thin deposit.

Case 6. Male, age forty-five; healthy, with no pronounced diathesis. Strong teeth. Saliva normal in quantity, moderately slimy, alkaline; mucus alkaline to neutral; ammonia above normal, chlorids normal, sulfo-cyanids under normal, phosphates in moderate quantities. She had used for a number of years the English tooth-paste referred to in Cases 1 and 2. Since leaving it off the erosion has made but little or no progress.

Case 7. Male, age fifty; affirms that he has no complaint whatever, in particular neither gout nor rheumatism. Reaction of saliva alkaline; mucus of upper lip slightly acid, of lower lip neutral. Extensive wasting, especially on the *right* side. He holds the tooth-brush in the left hand, and has for over thirty years employed the tooth-paste just mentioned.

These are only a few of the cases which I have examined, and which have shown the predominating influence of brush and powder. Even many cases which have been cited to me as evidence against the mechanical origin of wasting seem to admit of a ready interpretation in accordance with it. A tooth was sent me by Dr. Brunsmann of Oldenburg, a lower lateral incisor which had been loose for many years, showing wearing of the lingual surface at the neck, due to the rubbing of a plate, and also a slight wearing of the labial surface at the neck. The neighboring teeth are firm and free from wear. Dr. Brunsmann argues that the condition in this case cannot have been produced by the brush, since the neighboring teeth must likewise have been affected. The fact, however, that this tooth had been loose for many years, justifies the inference that the neck had lost the protection afforded by the gums; in other words, it was denuded and therefore subjected to the direct friction of the brush. Dr. Brunsmann likewise reported to me a case in which an upper second bicuspid alone had a wedge-

shaped defect at the neck. Here, again, the tooth stood alone, its neighbors having been lost, and it was tilted inward so far as to cause an exposure of the dentin at the neck.

Many cases have been referred to of teeth showing wasting on the lingual surface, but these are exceedingly rare; by far the majority of cases of so-called erosion found in collections of teeth have been produced by friction of plates,

FIG. 3.



a, Wasting of lingual surface; *b*, of amalgam filling, produced by plate.

clasps, antagonists, etc., as a careful examination with the magnifying glass will show. We usually find the surface of such defects studded by many oval or longish facets, giving sometimes the appearance as though a miniature rodent had been gnawing at the tooth. Where these defects have been filled, the filling may show the same appearance. (Fig. 3.)

It must also not be forgotten that the lingual surface of the teeth is quite accessible to the brush, and, especially in the upper molars and bicuspsids, may be reached about as easily as the buccal sur-

face. This is well illustrated by the following case:

The patient, a lady in the fifties, has worn a full upper plate for many years. Of the lower teeth only the incisors, canines, and three bicuspsids are left, and the teeth are all strongly protruding. (See Fig. 4.) The left incisors, *B, C*, both show wearing away at the neck, slightly sloping up toward the right side. The left canine, *A*, is very much rounded off distally. *The right incisors, D, E, have amalgam fillings on the lingual surface, and those are markedly worn, the enamel margins standing high above the amalgam and the marks of the brush being plainly visible.* Wasting is also present in the labial surface. The absence of teeth in the upper jaw and the protrusion of the lower teeth made it just as easy for the patient to brush the lingual as the labial surfaces, and having only the lower front teeth to look after, she did it well, using besides a sharp tooth-powder containing an insoluble grit.

Then, again, extraordinary factors may occasionally come into play to produce wasting in unexpected places. For example, Professor Warnekros of Berlin related a case to me in which a man had for a long series of years been in the habit of taking lozenges into the mouth and rubbing them with the tip of the tongue against the lingual surface of the lower incisors, by which means he had in the course of many years produced distinct grooves in them.

Reports of wasting in the teeth of animals, which have appeared from time to time in the journals, have little bearing on the question. A carnivorous animal may readily wear a groove in his canines at the neck, where the enamel is thin; and likewise herbivorous animals—particularly ruminants that graze on short grass on sandy soil—may wear the teeth away at the necks by throwing the bolus of food about for hours daily. Much has been made of the fact that the teeth of seals show defects resembling wasting, but if it be true, as stated by Coleman, that seals take stones and probably also sand into their mouths, the fact is easily accounted for. I intend making the wasting of the teeth of animals the subject of a separate communication, and shall therefore not

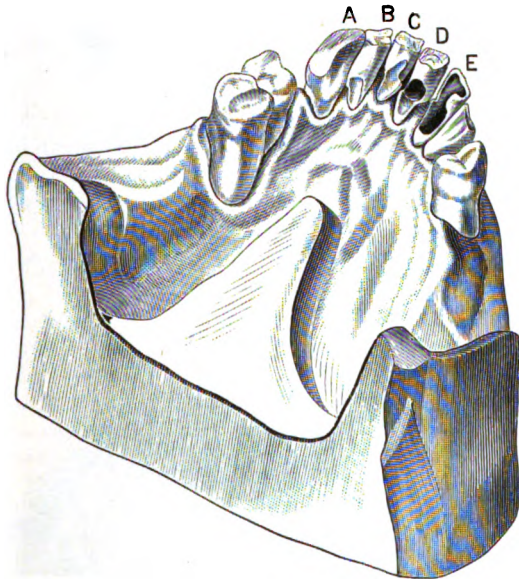
enter into a detailed discussion of this question here.

ARTIFICIAL PRODUCTION OF WASTING BY MECHANICAL MEANS (ABRASION).

Not only do we meet with many cases of extensive abrasion of the teeth where gritty tooth-powders or pastes have been used, but it is a very easy matter to produce artificial abrasion by use of such

or of the brush alone was to be tested, the teeth were fixed in sealing-wax, as it was found that plaster of Paris itself contains a sufficient amount of grit to act upon the dentin. A piece of pink gutta-percha was also placed across the root to represent the gums, as this material very stubbornly resists the action of the brush. With some of the much-extolled preparations on the market it is quite easy, by applying the brush as nearly as possible

FIG. 4.



Wasting of lingual surface; wearing down of amalgam filling in D and E, produced by brushing with tooth-powder.

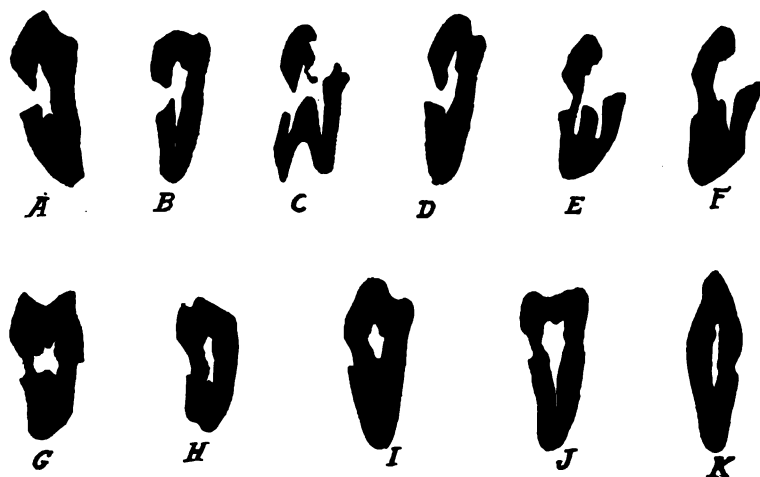
preparations. In Fig. 5 we have silhouettes of sections of teeth showing the effect of different powders applied for two hours by a moderately stiff brush.

The tooth to be experimented upon was fixed horizontally in plaster of Paris, and when a single tooth was brushed, a piece of pink gutta-percha was placed at each side to represent the neighboring teeth and prevent the brush from acting too much on the sides of the tooth. When the action of very fine substances

in the same manner as it would be used in the mouth, to cut the tooth half through, exposing the pulp, inside of two hours. (See Fig. 5.)

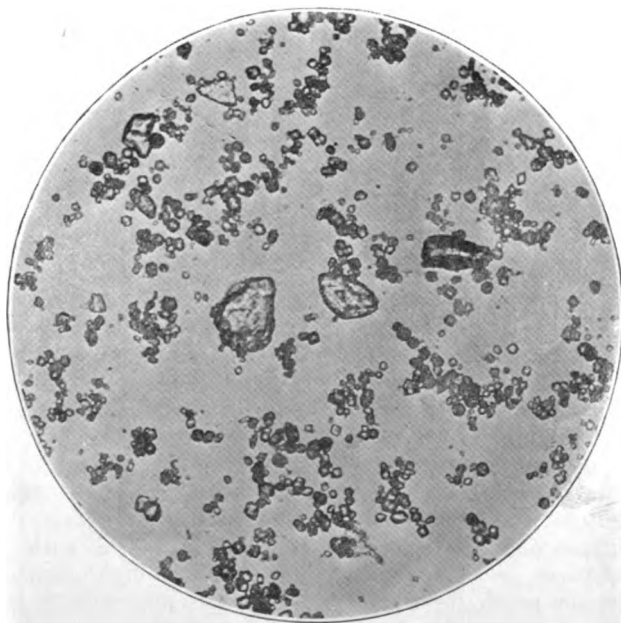
Besides the substances whose action is shown in Fig. 5, a great many other tooth-powders were examined. In fact, I was not satisfied with examining the preparations microscopically, but where there was any doubt I tested them by brushing the teeth with them. Of the dentifrices examined a considerable num-

FIG. 5.



Comparative action of different tooth-powders applied with a brush for two hours; *A*, Chinese tooth-powder; *B*, Tooth-powder shown in Fig. 10; *C*, Japanese tooth-powder; *D*, A German tooth-powder; *E*, A much-used English tooth-paste; *F*, Tooth-powder containing a gritty residue probably powdered oyster-shell; *G*, Precipitated calcium carbonate; *H*, An American tooth-paste; *I*, A French dentifrice; *J*, Prepared chalk; *K*, Cigar ashes (defect on right side of tooth).

FIG. 6.



French dentifrice designated above as *I*, under microscope: Precipitated calcium carbonate; larger particles not determined.

ber cut the teeth rapidly; while nearly all the others cut the teeth to some extent—least of all that I have examined, one which consists almost wholly of sodium bicarbonate. I was surprised to find that even precipitated chalk wore the dentin away rather rapidly—but this one can understand in view of the fact that the substance consists of a mass of fine crystals, which although they are very small, are still sharp, and sufficiently hard to abrade the dentin. (See Fig. 6.) Prepared chalk acts upon the teeth with a rapidity depending upon the amount of impurities which it contains. We shall find on washing out prepared chalk that among different preparations some contain considerable quantities of remains of shells and other gritty substances, which make them unfit for use as tooth-powder. Other preparations which are comparatively free from these impurities act more slowly upon the dentin. Powdered tartar wore away a very shallow notch in a tooth in the space of four hours; soap produced a slight but clearly visible effect; saliva, as well as water, barely more than polished the surface. Still, on brushing three teeth, set in sealing-wax, continuously for six hours with a new, moderately stiff brush, the margins of the scratches caused by the forceps in extracting were smoothed off, so that a certain slight effect may, after all, be produced.

In the accompanying illustrations photomicrographs of some of the chief constituents of mercantile tooth-powders or the powders themselves are shown under a moderate magnification: Fig. 7, pulverized pumice; Fig. 8, an insoluble grit possibly powdered oyster-shell; Fig. 9, a powder widely advertised in America; Fig. 10, a powder used for a long series of years—as long as he could remember—by an old gentleman, who had completely divested his teeth of their enamel.

The form of the cavity produced depends upon the shape and size of the brush, as well as upon the position and thickness of the gutta-percha strip representing the gums. This strip forms a kind of a directing line to the action of

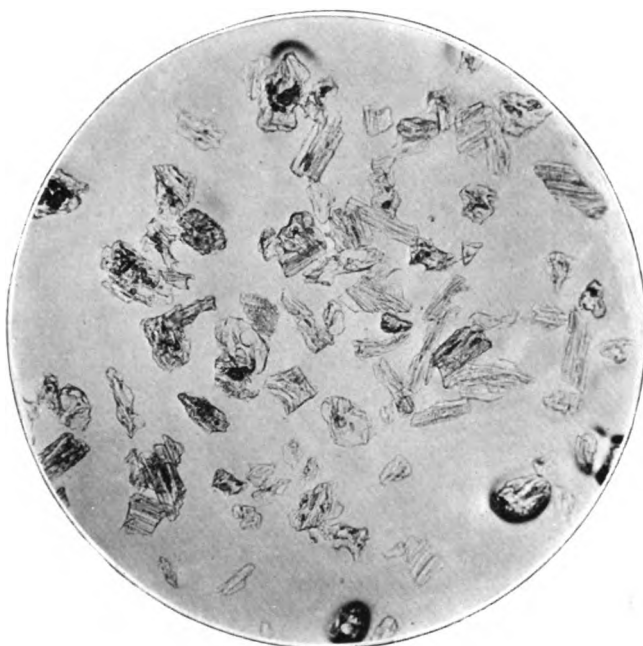
the bristles; they are pressed together at this line, and consequently cut deepest there. When the teeth are brushed without any such boundary we get a cavity of a different shape. (See Fig. 5.) The relative position of the teeth to each other when a whole row is brushed at the same time, also markedly influences the result. Very often several grooves and notches appear, such as are occasionally met with in the mouth.

The action of the brush and powder upon the enamel is slower than upon the dentin, so much so that some have stated that it is not possible to wear away the enamel by such means.

In an article in the *Dominion Dental Journal* for September 1906, taken from the *Dental Brief*, the name of the author of which is not given, we have the computation based on results obtained by experimenting with a brush wheel, with which Methuselah might have brushed his enamel with pumice twice or even four times a day for his whole life (969 years) without producing anything more than a brilliant polish. Supposing a man brushes his teeth ten seconds four times a day, we shall find on computing that in the course of 969 years he would have brushed altogether 483 days at eight hours a day. I can assure the gentleman that he would be spared the trouble, as he would have no vestige of a tooth left, either dentin or enamel, by the time he had well begun his task.

With a brush wheel two inches in diameter, revolving with moderate rapidity, I wore away the greater part of the enamel of the central incisors in an upper denture in ten hours. Wedge-shaped defects were produced, extending through to the pulp-chamber, and on the left central the loss of substance extended along the mesial approximal margin two-thirds of the distance to the cutting edge of the tooth. I did not attach any importance to this result, as the conditions of the experiment differed too much from those actually present in the mouth. More trustworthy results were obtained by use of a tooth-brush mounted horizontally, and run by a motor at a rate of 240–460 os-

FIG. 7.



Photomicrograph of powdered pumice stone.

FIG. 8.



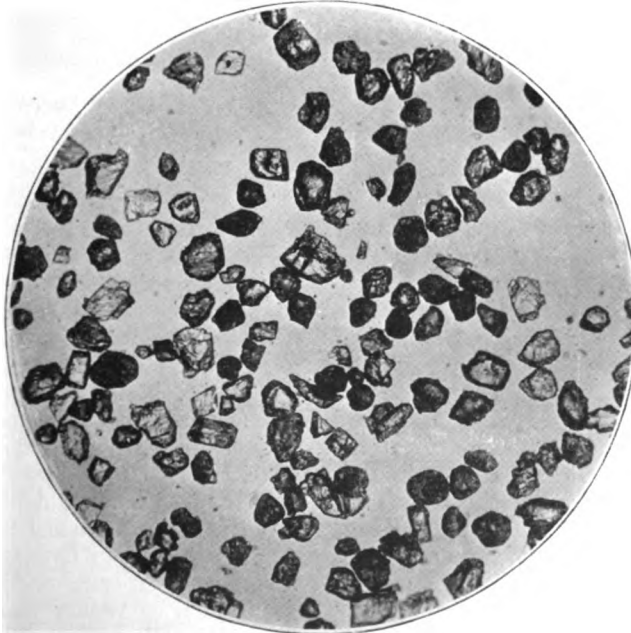
Photomicrograph of a tooth-powder consisting almost wholly of powdered oyster-shell.

FIG. 9.



Washing from a widely advertised American tooth-powder: Calcium carbonate (small crystals); larger particles not determined.

FIG. 10.



Undetermined crystalline substance in a tooth-powder which had caused severe destruction of the teeth.

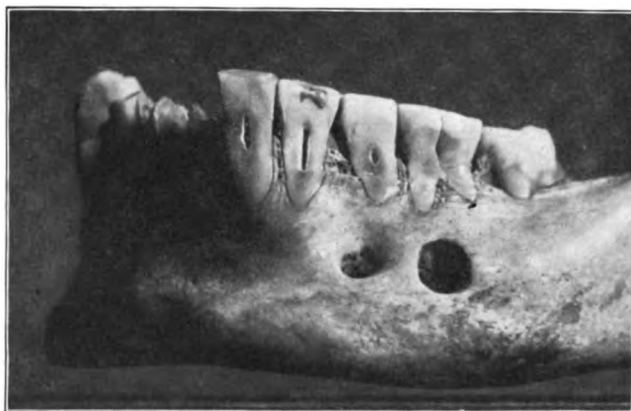
cillations per minute, which arrangement is referred to when I speak of the motor brush. In most of my experiments, however, I adopted the more natural and more reliable method of brushing with the hand—at an immense sacrifice of time, it is true, but still I think that the sacrifice was warranted by the importance of the subject. My assistant and I have spent during the last year an average of sixteen hours a day, and altogether, on a very moderate estimate, 10,000 hours on the work here recorded.

Fig. 12 we have a photographic reproduction showing the effect of brushing with a much-used English tooth-paste and powdered oyster-shell alternately, for 8, 11, and 18 hours respectively. (See also the table on page 18.)

From these experiments it follows that the enamel is certainly susceptible to the action of gritty tooth-powders, and that within a reasonable length of time.

We may put it down as an axiom that anyone who brushes his teeth once daily *thoroughly*, using a gritty tooth-powder.

Fig. 11.



Abrasion of teeth produced by brushing with a much-used English tooth-paste for eighteen hours. (Remains of gold filling in first bicuspid.)

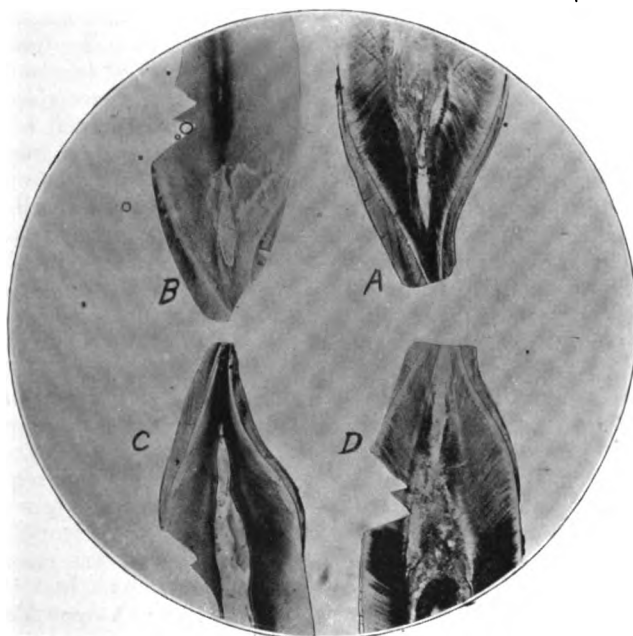
As for the question at present under consideration, I found that on brushing the left side of a lower denture with a much-used English tooth-paste, the whole of the enamel and the dentin of the buccal surface of the canine and bicuspid were brushed away, exposing the pulp-chamber in eighteen hours. The molars were deeply notched. (Fig. 11.) This would correspond to brushing each half of the dental arch, above and below, for ten seconds daily for eighteen years. Some brush considerably more and some considerably less than this. In this experiment enamel, dentin, and gold wore away with about equal rapidity—a noteworthy result, to which I refer later on. In

will invariably wear away his teeth at the necks inside of a very few years, *unless they are protected by healthy gums.* The wearing away will gradually extend upon the enamel, and in the course of ten to twenty years considerable portions of the enamel plate may be destroyed. It is to be noted in this connection that the enamel, while being worn away, may preserve a high polish, and it may even escape the notice of the dental practitioner that the plate of enamel is gradually becoming thinner. I have had dentists say —“I have been using a gritty tooth-powder for ten or twenty years, and I have no wasting;” yet a careful examination with a magnifying glass has shown

the worn surface readily recognizable by anyone who has made a study of this subject, and looking at the tooth from the cutting edge we may find the plate of enamel as thin as paper. As a matter of fact we seldom notice that the enamel is wearing away until the whole plate is broken through and the dentin exposed.

brush them. One patient, suffering from abrasion, told me that he often spent as much as five minutes over his teeth; and one lady assured me that she devoted one hour daily to the care of her teeth—a rather strong exaggeration, no doubt. Others perform the whole operation inside of fifteen seconds. Some charge the

FIG. 12.



Effect of brushing with a much-used English tooth-paste and powdered oyster-shell: *A*, at beginning; *B*, after eight hours; *C*, after eleven hours; *D*, after eighteen hours.

A case recently came to my notice in which a young lady, who is very proud of her white teeth, had, by a vigorous use of Chinese tooth-powder consisting chiefly of pumice, very perceptibly worn down the enamel of her front teeth, inside of three years.

It must also be borne in mind that there is a vast difference in the manner in which different people brush their teeth. In fact, there are about as many ways of brushing the teeth as there are people to

brush with a great quantity of powder, others only dip the tip end into it, others again use powder only occasionally, and many not at all. Some run the brush horizontally along the necks of the teeth, some diagonally from the cutting edge of the incisors across to the neck of the first molar. The manner of holding the brush and the shape of the teeth are also factors of importance; likewise the inclination of the teeth to each other and to the alveolar process—as has been pointed

out by S. P. Mummery. The only pronounced case of wasting of enamel I have met with in an experience of twenty-two years in a dental clinic was that of a man who closed his teeth when he brushed them. The upper row closed over the lower, and formed a channel along which he worked the brush backward and forward, and in the course of years he wore away a great part of the enamel of the lateral incisor, canine, and bicuspid of the left side of the lower jaw, using cigar ashes and powdered oyster-shell as a tooth-powder.

Almost invariably the wasting will be found to attack the prominent teeth in the arch most severely, and will not be found on those teeth which are not reached by the brush. This fact is, however, modified to some extent by the shape of the teeth, as indicated above. If the labial surface of an incisor be markedly convex, we shall find in passing a brush over the surface horizontally that the bristles divide in the middle, and spread out toward the neck and the cutting edge of the tooth. The result *may* be that we shall get wearing at the neck and at the cutting edge, while the more prominent point of the tooth remains comparatively free. So, too, if a tooth be so set as to make an angle with the alveolar process, we shall find a tendency of the bristles to work up toward the margin of the gums, with a corresponding effect at this point; but wherever a tooth is, for instance, rotated on its axis, so as to make one margin stand higher than the other, this margin will be more severely attacked, in fact it will often be the only margin affected. The same is also true of experimental wasting. It is sometimes said that teeth which stand inside of the arch are subject to wasting, and so they are. If we fix three teeth in plaster of Paris—the middle one considerably lower than the other two—and brush them, we shall find the middle tooth becoming worn as well as the others, but not to the same extent, and that too is the case in natural wasting. We never find a tooth which lies lower than its neighbors as strongly cut as they,

unless it be a case in which there has been a change in the position of the teeth; but such a case has never come to my notice.

A sufficiently vigorous use even of prepared chalk will tell upon the teeth in the course of time. In a case of severe wasting which had been gradually progressing for thirty years, nothing more gritty than *creta preparata* could be made accountable. The patient used this three times a day, and so vigorously that she wore away *two brushes every month*. No wonder that the teeth also suffered. The *condition of the tooth-brush*, by the way, may sometimes give us a clue to the cause of the evil, and when we find the bristles wearing down rapidly we may be pretty sure that there is a gritty powder, and vigorous usage back of it, and that the teeth are wearing also. Anything which wears away the brush will also wear away the teeth, particularly the dentin. A brush that has been used with powder so as to cut a tooth through to the pulp-canal, as in Fig. 5, will show but slight wear, and in brushing away the entire enamel and a good part of the dentin from the facial surface of five teeth, only two brushes were required. In these the bristles were worn to within one-quarter inch of the ivory.

My attention was recently called to a tooth-brush which had been in use for twelve years. No powder had been used with it, and still it was stated that the bristles were worn down to within one-quarter of an inch of the ivory. This hardly seems a fair test, since the boiling to which the brush had been subjected as a means of disinfection must have materially affected the durability of the bristles. During the ordinary life of a tooth-brush—six months to a year—we will find no shortening of the bristles by wear except a powder be used—unless they are rendered brittle by some process of disinfection. A tooth-brush used *without powder* continuously for six hours in brushing three teeth set in sealing-wax did not show a trace of wear.

I have made it a point to ask for the brushes of patients suffering from wast-

ing of the teeth, and have a collection which is very instructive. We must, however, guard against a bit of deceit which is sometimes practiced by patients whose brushes are not in good condition, and who send in a new brush instead of the old one which we asked for.

Taking it all in all, I have come to the conclusion that we have formulated our question regarding wasting of the teeth wrongly. It should not be, Why do some people have it? but, Why do not many more people—in fact why does not everyone who uses a brush and powder—suffer from it? Here the answer is comparatively easy to give. So long as the necks of the teeth are covered by healthy gums, they are effectually protected against the action of the brush, and it takes a number of years to wear away the enamel sufficiently to expose the dentin; before this time, the wear, although it may be in progress, escapes our notice. Then again, as already pointed out, it is only a small minority of our patients who really give their teeth a thorough brushing, even among those who claim to be particularly scrupulous in this respect; and an occasional brushing only, with a little powder for a few seconds, will be a long time in producing any appreciable effect.

SUSCEPTIBILITY OF DIFFERENT GRADES OF TEETH TO ABRASION.

A general impression seems to exist that wasting is a lesion affecting chiefly teeth of good structure, well-developed, yellow, so-called hard teeth. My observations have not always tended to support this impression. I think we may say that, in general, teeth badly affected are of the yellow grade, though I have noted very many exceptions. It appears to me, moreover, that the chief reason for the impression that wasting is characteristic of yellow, hard teeth is to be found in the fact that this lesion is observed chiefly in advanced age, and that the color of the teeth likewise becomes darker as age advances. Nevertheless, I have

given attention to the question as to whether teeth of different color are susceptible in different degrees to mechanical action, and have made many experiments relative to it. The teeth were fixed in a row, the light and dark shades alternating, and subjected in some cases to the action of the motor brush, in others to the hand brush.

Eight teeth were fixed at equal distances from each other in plaster of Paris, and as nearly as possible on the same level, 1, 3, 5, 7 being teeth of lighter color, 2, 4, 6, 8, more yellowish. They were then brushed with the motor brush and pumice until about half brushed away. On laying a strip of articulating paper upon the surfaces, and pressing it down with a perfectly straight edge, the markings on 1 and 7 indicated that their surfaces lay a trifle higher than those of the other teeth. 5 and 6 lay sufficiently low to be untouched by the paper; in other words, they had been brushed away somewhat more than the other teeth, though the difference was slight. But as one of these was a hard, and the other a soft tooth, this result could not be taken as indicating whether one class is more susceptible to the action of the brush than the other.

In a second experiment, a senile tooth with a transparent, amber-like root was distinctly less affected than the neighboring white teeth.

In a third experiment, in which the teeth were brushed with pumice wet in a five per cent. solution of oxalic acid, slight differences could be detected, but not sufficient to justify a definite conclusion.

In a further experiment, in which six teeth, white and yellow alternating, were ground down to the middle before the experiment was begun, one very whitish, badly developed tooth showed considerable more wear than the other five, which were about equally affected.

We may accordingly say at present, that while there seems to be a slight difference in the resistance which the dentin of different teeth offers to the action of the brush and powder, further experi-

ments will be necessary before we can come to a final conclusion regarding this point.

With regard to the enamel, there is no doubt that its structure has great influence upon its susceptibility to mechanical action. I have seen badly developed, chalky spots in the enamel wear away much more rapidly than the surrounding normal tissue. Also, in the case of a hypoplastic tooth, I found, on splitting it into halves and brushing the split surfaces with pumice, that the enamel wore away faster than the dentin, whereas, as a rule, dentin wears away approximately fifteen to twenty times as fast as does enamel.

In an experiment in which five teeth were brushed three hours with chalk, eight hours with a proprietary tooth-powder, four hours with twenty per cent. pumice, and three hours with pure pumice, the enamel of a bicuspid was completely gone at the eighteenth hour, while that of a whitish incisor did not yet show a break. In another case a brushing of thirty-three hours with an English tooth-paste and fourteen hours with Chinese tooth-powder was required to accomplish a result similar to that shown in Fig. 11, and produced in eighteen hours.

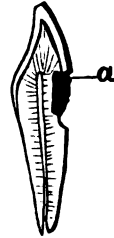
The enamel offers the greatest resistance to friction with powders when it is applied to the free surface and to the *ends* of the prisms. In case of wedge-shaped defects, either natural or experimental, which encroach upon the enamel in a plane nearly parallel with the direction of the prisms, and in which the friction is consequently applied to the *sides* of the prisms, we find the enamel yielding about as rapidly as the dentin.

WEARING AWAY OF FILLINGS.

A potent argument in favor of the mechanical origin of wasting is to be found in the fact that fillings of amalgam and gold so often suffer from it. In fact, where cavities produced by the process under study have been filled for some years with either of these materials, we

shall invariably find considerable wearing away of the filling unless the patient has changed the manner of caring for his teeth. The wearing of the filling may often escape the notice of the patient as well as that of the dentist, because the tooth-substance wears down at the same time. I have repeatedly seen gold fillings

FIG. 13.



Wearing out of amalgam filling.

polished, cupped, or grooved by the action of the brush, and amalgam fillings almost worn out altogether, as was the case in the tooth seen in section in Fig. 13.

In Fig. 14 I have reproduced a case which is particularly deserving of attention:

The patient, a man of about forty-five years, was in fair health with the exception of an occasional attack of asthma and a rheumatic tendency. The loss of substance was most extensive in the front of the mouth, growing gradually less toward the back, the third molars being quite free; the facial surface of the six front teeth, in particular, as well as the cutting edge or cusp, was completely denuded of enamel, and also a fair amount of dentin had been lost, the two surfaces meeting in a sharp edge at right angles. On closing the mouth there was a space of about one-fifth of an inch wide between the upper and lower rows. The teeth were exceedingly sensitive to the excavator, as well as to changes of temperature and to fruit juices.

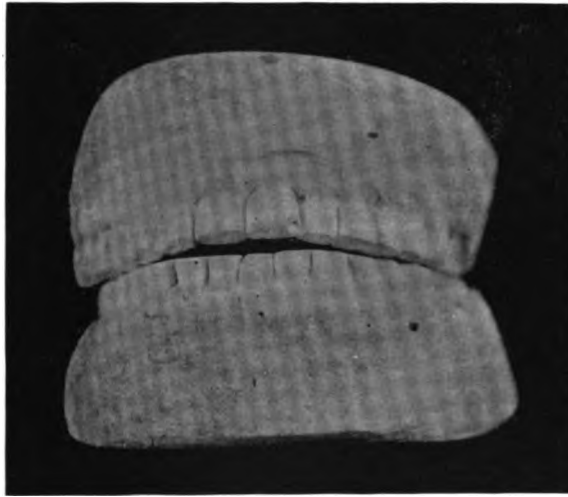
In the year 1880 the surfaces of all the teeth were restored with gold, which was well hammered and built down (or up) almost enough to restore the articulation. In the course of ten years the gold had for the most part completely worn away from both the facial surface and the cutting edge, although

at the last the teeth did not come together to within one-fifth of an inch, in a number of them only the gold in the retaining points and grooves being left. In some of the teeth the gold, dentin, and enamel were all wearing away at the same rate, neither of these substances projecting above the others. Whatever the cause of the wear in this case, it affected all three substances about equally—on the cutting edge absolutely equally, as was also the case in the experiments shown in Fig. 11.

amalgam, another with gold, and were brushed for half an hour with a motor brush and 10 per cent. pumice. The dentin wore away rapidly at the neck; the amalgam filling likewise showed a considerable wearing, and four parallel grooves formed on its surface; the gold was but slightly affected, and the enamel least of all.

When a tooth containing a *small* fill-

FIG. 14.



Case of gradual wasting of both tooth-substance and filling material notwithstanding the open bite.

COMPARATIVE WEARING OF FILLINGS AND TOOTH-SUBSTANCE.

The rate of wearing away of fillings and tooth tissues is a matter of great importance, as it very often gives us a clue to the nature of the process, which would otherwise have remained in doubt. For that reason a large number of experiments were made relative to this question. If, for example, we brush a block of ivory containing a gold filling in the center with 5 to 10 per cent. pumice, we find the ivory wearing away and the gold standing out above the surface. Four teeth were fixed in plaster of Paris, one of them filled on the exposed surface with

ing of gold or amalgam on the free surface of the enamel is brushed, the cement and the dentin wear away most rapidly, then the amalgam, after that the gold, and last of all the enamel. The gold, although considerably softer than dentin, is not so brittle, and wears less rapidly, consequently we shall usually find the surface of the gold standing higher than that of the dentin, and slightly lower than that of the enamel. When *large* gold fillings are inserted—covering, for example, a greater part of the labial or buccal surface—then, under the action of the brush and powder, enamel and gold wear down about equally. Also when the brush strikes the enamel parallel to the

direction of the prisms, the enamel wears approximately with the same rapidity as the gold. For instance, if we grind down a molar tooth about one-third of its diameter and insert fillings of gold, pink gutta-percha, and amalgam, and then after the setting of the amalgam brush the surface with a powder, we find that the dentin becomes cupped out sometimes in a striking fashion, leaving the margin of the enamel standing above the surface.

shown in Fig. 14. In the case of badly developed enamel it may wear away even faster than the dentin, as I found particularly in a tooth with faulty (hypoplastic) enamel.

In examining a severe case of wasting of the lower front teeth (in the practice of Zahnarzt Brausewaldt), I was struck by the marked wearing of an amalgam filling on the labial surface of the left central incisor, and the question came up,

A. Gold filling in left canine.

	1 h.	3 hrs.	5 hrs.	7 hrs.	9 hrs.	11 hrs.	13 hrs.	16 hrs.
(a)	.00	0.06	0.10	0.13	0.19	0.30	0.38	0.56
(b)	.00	0.03	0.06	0.09	0.12	0.12	0.26	0.32
(c)	0.02	0.10	0.16	0.21	0.30	0.40	0.46	0.54

B. In left lateral.

(a)	0.14	0.44	1.04	1.50	1.84	2.34	2.52	2.94
(b)	0.08	0.24	0.38	0.42	0.92	1.68	1.75	2.08
(c)	0.02	0.18	0.28	0.34	0.42	0.48	0.68	1.92

C. Amalgam filling in left central.

(a)	0.20	0.34	0.80	0.95	1.15	1.70	2.00	2.90
(b)	0.08	0.26	0.40	0.65	1.05	1.70	1.80	2.20
(c)	0.10	0.20	0.30	0.42	0.50	0.60	0.65	0.90

D. Right central from which the enamel had been removed.

(a)	0.35	0.90	1.40	1.86	1.94	2.60	3.00	3.30
(b)	0.20	0.45	0.90	1.38	1.68	2.10	2.45	2.70
(c)	0.10	0.24	0.24	0.60	1.05	1.60	1.80	2.10

The enamel, however, also wears down, and we shall find it, the gold, and the pink gutta-percha standing at very near the same level, the amalgam being somewhat lower.

Occasionally I have observed, without being able to account for it, that gold, enamel, and dentin have worn down with equal rapidity, so as to produce a perfectly flat surface. In the case of the artificial wasting shown in Fig. 11, the first bicuspid had a large gold filling on the buccal surface; it is all worn away except the bit seen at A in the photograph, and the enamel, dentin, and gold form a perfectly flat surface. We found the same condition in the case of natural wasting

How much wear on the enamel and dentin does that correspond to, or how much of the wasting observed has taken place since the insertion of the filling referred to? In the attempt to answer this question, and to determine in general the relative rapidity of wearing of tooth-substance and filling, the following course was adopted: In a lower jaw the left canine was furnished with a large gold filling on the labial surface, the central similarly filled with amalgam, the right first bicuspid with gutta-percha, and the second bicuspid with a small gold filling at the neck. The left lateral stood slightly outside of the arch, and the right lateral inside. The enamel was re-

moved from the right central on the lower half, i.e. from about the middle of the crown to the neck of the tooth. The teeth were now brushed for sixteen hours with a much-used English tooth-paste alternating with powdered oyster-shell, and the depths of the teeth were carefully taken every two hours with a nonius.

The measurements were taken from three different points: *a*, at the neck of the tooth; *b*, at the middle of the crown; *c*, near the cusp or cutting edge. The table opposite shows the wear in millimeters.

It will be seen that the gold filling wore least of all, and more at the neck and tip than in the middle of the crown. The lateral incisor naturally suffered most at the neck (*a*), where the enamel was wanting. At (*b*) the wear proceeded slowly for the first seven hours until the enamel was broken through, when it went on much more rapidly. At (*c*) the same stage was not reached until near the close of the experiment—13th hour, the enamel being thicker toward the cutting edge. Note the comparatively rapid wearing of the amalgam filling in the left central. The slighter wear near the cutting edge (*c*), is due to the fact that the filling was here protected by strong enamel walls and the whole tooth stood slightly inside the arch. The most extensive wearing is seen in the right central, where the action was upon the dentin. The small gold filling in the neck of the second bicuspid stands out like the head of a pin. Likewise the pink gutta-percha is considerably higher than the surrounding dentin.

From this and various other experiments I have determined that gold wears according to the circumstances noted above, as rapidly or slightly more rapidly than normal enamel. Amalgam wears about four times as rapidly as gold, and dentin about four times as rapidly as amalgam. More exact figures will be given later. These relations exist only where the surfaces are all equally exposed to friction. We shall see that under the simultaneous action of acids and friction, a very different result is produced.

Pink gutta-percha offers practically the

same resistance to the action of brush and powder as enamel.

With regard to the question above proposed in the Brausewaldt case, I determined by restoring the contour of the amalgam filling, taking measurements before and after, that there had been a loss of substance amounting to 0.7 mm., or about the same loss as was produced in the middle of the filling C by seven hours' brushing. This corresponds to a loss of 0.34 mm. of enamel at its thicker part, B (*c*) and of 1.50 mm. in the dentin, B (*a*). The amalgam filling was two and one-half years old, and we conclude, accordingly, that in this case of Brausewaldt's the patient used friction enough to wear down the enamel 0.34 mm., and the dentin 1.50 mm. approximately in two and one-half years.

BEHAVIOR OF TARTAR UNDER THE WASTING PROCESS.

The appearance of tartar on teeth suffering from wasting may sometimes furnish a clue to the nature of the process.

FIG. 15.



Showing effect produced upon tartar under the wasting process.

In Fig. 15 we have, for instance, a case of wasting in which the tooth is incrustated with tartar, and the tartar is cut in a

plane perfectly flat with the surface of the tooth. We have in this fact evidence that the wasting has been caused by some rigid body, since my experiments have shown me that a tooth-brush rounds off the margins of the tartar; but I shall return to this point later on, under the heading of mechanical action in conjunction with acids.

ACTION OF FOOD AND OF CRYSTALLINE BODIES IN THE SALIVA.

I have already referred to the wearing down of the teeth both of men and of animals by the habitual use of food containing hard or gritty substances. We know that in the course of years the teeth may be considerably worn even under an ordinary diet. The question naturally arises whether the friction of food upon the facial and lingual surfaces of the teeth may not also wear away the enamel and dentin. My studies in relation to this question have convinced me that any loss of substance from this cause is under ordinary circumstances a negligible quantity. How slight this friction of the food upon the facial surface of the teeth is, may be seen from the fact that it barely suffices to keep this surface free from precipitates, greasy deposits, etc., especially at the necks of the teeth. Still less does the friction of the lip or cheek alone have any wearing effect upon the teeth.

The idea has also been expressed that certain crystalline substances normally present in the saliva may assist in wearing away the teeth. By brushing a molar for three hours with crystals of acid calcium phosphate moistened in water, a considerable wearing away at the neck and roughness of the enamel were produced. The surface was not quite dull, but it lacked the characteristic high polish. The mechanical action of the crystals was here modified by the acid action. We are not quite sure, however, that the acid calcium phosphate occurs in the oral fluids; if it does, we shall find it in solution. It will be chiefly the in-

soluble phosphates and possibly oxalates that come into consideration here. These we will find in a condensed form in the deposits upon the teeth (tartar). By the use of powdered tartar on a brush I was able to wear a slight groove in the neck of a tooth in four hours. No action upon the enamel could be detected; brushing with saliva had no appreciable effect beyond polishing of the surface possibly, with a nominal loss of substance. We need not fear that we may be going wrong in attributing but very slight importance to agencies of this nature.

MECHANICAL ACTION OF CURRENTS OF SALIVA.

Mr. S. P. Mummery has suggested the possibility that channels may exist in the mouth formed by the margin of the gums, along which currents of saliva flow and gradually wear away the teeth after the manner of the dropping water wearing away the rock. But neither Mr. Mummery nor I found any action when a fine stream of water from the hydrant was allowed to strike upon a tooth for seven days in succession. I imagine, however, that I am right in supposing that it is only because the running water conveys occasional grains of sand, that the rock is gradually worn away. We must conclude, accordingly, that currents of saliva can have no effect upon the teeth, unless they carry some gritty substance with them. In such cases, undoubtedly, the teeth might show a slight superficial wearing in the course of time, as is demonstrated by my experiments.

A jar holding ten liters was filled with water and about half a pint of pumice added. From this, by means of a syphon, a fine stream of water was made to fall upon the surface of a tooth. In two weeks no loss of substance could be detected, but the surface was highly polished, thereby indicating a certain amount of mechanical action. It should be noted that the stream of water did not carry pumice all of the time. As often

as we thought of it during the day one of us stirred up the pumice, but in about ten minutes it had again settled to the bottom of the jar, so that the actual amount of time during which the stream of water carried pumice was comparatively small. In a second experiment a number of teeth were inclosed in rubber tubes, with a hole about one-quarter inch in diameter cut so as to expose the dentin and enamel. The teeth were placed in a small flask containing powdered pumice in water, and fixed to a wheel revolving at the rate of ten revolutions per minute. In 100 hours a slight but still distinctly perceptible wearing of the dentin had taken place.

Finally, two teeth were fixed with sealing-wax in a glass tube twelve inches long, parallel to each other and across the tube, with a space of about 2 mm. between them at the neck. The tube, having been partially filled with water containing corundum powder, was rotated as above, end over end. The mixture rushing back and forward through the slot produced a slight wearing away and polishing of the surfaces. The time was not noted. In the absence, however, of appreciable quantities of gritty substance in the saliva under normal conditions, it becomes apparent that this factor also deserves but little consideration in the search for the causes of wasting.

ABSENCE OF WASTING IN POLIKLINIK PATIENTS.

Parreidt has made the statement that among patients of the Leipzig Poliklinik, wasting has been observed only once in 30,000 cases, and others have made similar observations.

During my earlier experience in the dental department of the University of Berlin, I found that severe cases of wasting were almost unknown among the class of patients that applied for treatment there. Occasionally I saw a case of wedge-shaped defect at the neck of the tooth, but I invariably found in such cases that the patients brushed their teeth

diligently with prepared chalk, which we have seen is quite sufficient to wear grooves at the necks where the teeth are denuded. I recall only one case in which there was a destruction of the enamel, and in this case, the patient being forty-five years of age, in perfect health, and particularly free from gout or rheumatism, had brushed his teeth for many years with cigar ashes and powdered oyster-shell.

The comparative absence of wasting among these patients is accounted for by the fact that very many of them have but recently begun to use the brush, and none of them can afford the fancy tooth-powders and pastes which are so destructive of tooth-substance.

It is, however, a very significant fact that wedge-shaped defects are now gradually becoming more frequent among our patients. This I can readily account for, as many of them have attended the clinic regularly for a long series of years, and have acquired the habit of brushing their teeth daily with powder.

We occasionally read, in the dental journals, of cases of wasting in which it is stated that the tooth-brush has never been employed, and these instances have always been made use of against the mechanical theory of wasting. To this I may reply that such cases, if they occur at all, are extremely rare. Among the ninety patients whom I have examined within the last few months, there has not been one who has not used the tooth-brush, and all of them but one employed powder at the same time. In this one case, the patient, a man seventy years old, said that he had been using tooth-soap for many years; previous to that time, however, he had used powder. The case to which I wish to refer in particular is one reported by Ivy in the *DENTAL COSMOS*, 1902, vol. xlv, p. 929, a case of wedge-shaped defect at the necks of the teeth, extending more or less upon the labial and buccal surfaces. There are two points which have been made in respect to this case, and which are supposed to argue against the tooth-brush.

In the first place, the teeth of the upper jaw were free from wasting, but as we

are told that these teeth were perfectly healthy and protected by healthy, firm gums, it is difficult to see how wedge-shaped defects could originate, and it is no uncommon thing to find the teeth much more wasted in one jaw than in the other, even where there can be no question as to the mechanical origin. In the second place, this patient is reported to have said that he had not used a tooth-brush for fifteen years. At the same time Dr. Ivy tells us that on the second visit, five years later, the wasting had not extended in any one instance, which simply shows that at the time being there was no wasting going on, and as the patient was not using a tooth-brush this can be readily understood. In all probability the wasting was a case of very old standing, and we are justified in drawing no conclusion whatever, unless we can prove that the patient did not make use of the brush previous to the period mentioned. In fact, the statement that he had not used the brush for fifteen years shows that he did use it before that time. This, together with the fact that the wasting was not going on at the time being, makes the case an argument in favor of the brush.

I have a number of cases of wasting which have been stationary for many years, and which owe their origin to the use, years before, of some powder containing pumice or oyster-shell. A case in the practice of Dr. Abbot, in which the condition bade fair to destroy nearly all of the teeth, which I had the privilege of examining a few days ago, has remained *in statu quo* since Dr. Abbot ordered a mild tooth-powder and a brush of badger hair.

WASTING OF THE TEETH IN UNCIVILIZED RACES.

We must in passing also refer to the question of wasting in races that do not use the tooth-brush, or an equivalent. In the year 1884, I examined all of the skulls in the Berlin anatomical museum, and did not succeed in finding a single case of undisputable wasting. But little

has been done in the study of this phase of the question since my publication. The late Zahnarzt Stieren of Wiesbaden wrote me some two years ago that he had examined twenty skulls with negative results. More recently Mr. S. P. Mummery of London has gone through some of the collections there, and confirms the above results in a letter just received. The testimony of Dr. Grevers of Amsterdam is particularly significant in this connection. During his studies, which have extended over many years, he has examined no less than 6000 old skulls, and he informs me that he did not find a single case of wasting among the entire number.

In examining collections of skulls in reference to this question, one must naturally avoid the mistake of putting down the deformations practiced by some races to the score of wasting. Also it must not be forgotten that certain races, that may be classified as non-civilized, still care for the teeth, using the well-known twig as a tooth-brush.

WASTING OF THE TEETH AMONG THE JAPANESE.

Considerable interest was aroused by a communication of Dr. Ottofy of Manila, at the Fourth International Dental Congress, printed in the DENTAL COSMOS, 1905, vol. xlvii, p. 71. Dr. Ottofy attributes the prevalence of wasting among the Japanese to the fact that they use human excreta for fertilizing their vegetable gardens, and believes that the small stature of the Japanese is to be accounted for in the same way. No proof beyond conjecture could be brought forward in support of this view, and after the exhibition of bodily activity and endurance on the part of the Japanese in the late war we cannot well accept the hypothesis that they have been brought up on poisoned food.

In particular	evidence in
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having had the opportunity to study it personally. From Japanese residents in Berlin I have received some information bearing on the point. I am told that the Japanese care for their teeth very diligently in the cities, using the tooth-brush, and in the country to a considerable extent still the wooden twig hammered out at the end to a bundle of fibrils. Mr. Teranoki says that while there are very many people here in Berlin who never brush their teeth, which is quite true, everyone does so in his country. Finally, I have obtained a sample of tooth-powder manufactured in Tokio and formerly used in Japan, which quite equals the famous Chinese tooth-powder in its roughness and its action upon the teeth.

(See Fig. 5, C.) Possibly investigations in this direction may throw some light upon the question of tooth-wasting among the Japanese.

As a result of the above experiments and studies, I have been more and more confirmed in the opinion that the majority of cases of wasting met with in daily practice are due chiefly to the action of the brush in conjunction with tooth-powder, and that compared with this one, other mechanical agents are of minor importance. The question now arises, What are the chemical agents which may be concerned in the process, and to what extent are they responsible?

(To be continued.)

SUPPLEMENTARY RETAINING FORCES AS AUXILIARIES TO THE LABIAL RETAINING APPLIANCE.*

By CALVIN S. CASE, D.D.S., M.D., Chicago, Ill.

IN a paper entitled "Principles and Technics of Retention in Orthodontia," read before Section IV, Fourth International Dental Congress in 1904, and published in the DENTAL COSMOS in its issue for June 1905, the author endeavored to arouse an appreciation of (1) the difficulties that are liable to be encountered in the retention of regulated teeth; (2) the importance of a thorough understanding of the principles of occlusion upon which the retention of regulated teeth is largely dependent for its permanence, and (3) the importance of exercising great care and skill in the construction of retaining appliances which are destined to be worn for a year or more, and frequently during longer periods, without examination or readjustment.

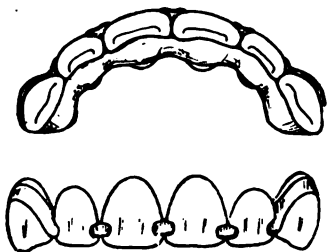
In the above-mentioned essay, of which this paper is a continuation, and in former papers, was described a labial retainer that has been in use in almost every case in my practice for the past ten years. It has therefore been well tried, and I wish to say at this time that were I deprived of its use the successful practice of orthodontia would be considered by me impossible.

This retainer, as shown in Figs. 1 and 2, will perhaps be recognized by some of the Chicago delegation, who doubtless have been given an opportunity to examine one or more of these appliances out of hundreds that have been and are still being worn by their patients. If so, I trust they will be willing on this occasion to attest to their perfection. They not only hold the teeth firmly, but are by far the

*[Dr. Case was on the program to read this paper before the last meeting of the National Dental Association. It was to have been illustrated with twelve specially prepared lantern slides, but was withdrawn because there seemed to be no opportunity to present it with the slides.—Ed. COSMOS.]

least conspicuous of anything that has yet been constructed which firmly grasps and immovably retains the teeth to which attachment is made. They, moreover, are fitted so closely to the teeth, with freedom from irritating prominences, that they

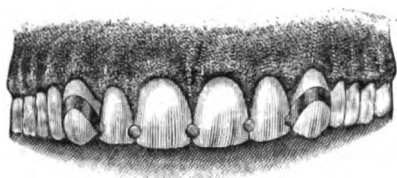
FIG. 1.



are willingly worn any length of time, the only requirement being that they shall be examined occasionally, and if found loosened in the slightest degree, removed and re-cemented.

After the correction of nearly all simple and complex irregularities, and also in classified irregularities, if the above six-band labial retainer be properly con-

FIG. 2.

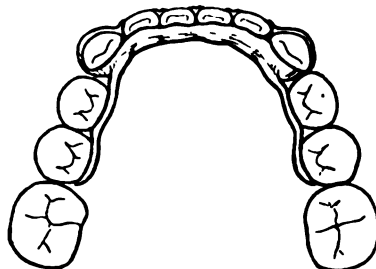


structed and attached, it will commonly be found sufficient in itself to perfectly retain the teeth, even though the buccal teeth, which may have been considerably moved, are not involved in the grasp of the fixture. This of course presupposes that the upper and lower teeth have been brought to the desired relative positions, and that the cusps of the buccal teeth perfectly interdigitate, though perhaps not in typically normal occlusion. There are, however, a number of important supplements to this appliance which will be demanded for the retention of extensive movements.

RETENTION OF LATERAL EXPANSIONS.

If one arch has been laterally expanded to the desired occlusion with the normal opposing arch which has not been moved, the simple six-band labial fixture shown in Fig. 1 will usually retain the expansion and any changed curve or mal-alignment of the labial arch. But if the operation has been performed without due regard to the forces of occlusion, and the opposing arch has been allowed to remain laterally contracted, the stability of these unmoved teeth will surely drive the expanded teeth back to their former position. This force of occlusion will frequently be sufficient to bend or displace

FIG. 3.



any labial retainer that is not of unusual proportions, and will finally complete the failure of the operation after the retainer is removed. When both arches have been laterally expanded—as they should be in the last-named condition—and if the lower expansion be supported with a clasp-metal bow No. 16 or 14 soldered to the lingual face of the six-band labial retainer as shown in Fig. 3, the forces of occlusion in connection with the regular upper labial retainer shown in Fig. 8 will usually be sufficient to hold both arches in position.

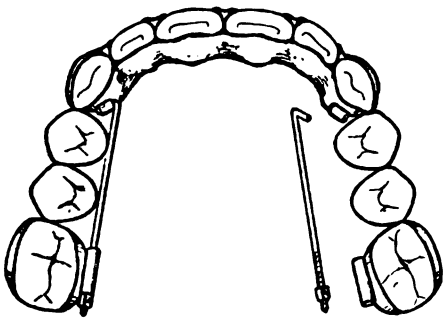
With certain occlusions it may be found expedient to attach the lingual bow to the upper arch instead of to the lower, and in some instances to both. The length of the arms and the size of the wire for the lingual bow will be governed by the demands of the case. If the distal area has been much expanded, with a demand that the arms extend to the molars,

they should be supported by thin lingual tubes soldered to No. 36 gold molar bands, and with every precaution in finish, for cleanliness and non-irritability.

RETENTION OF RETRUSION MOVEMENTS.

When all of the upper or lower labial teeth have been retruded to reduce decided protrusions and to close spaces occa-

FIG. 4.

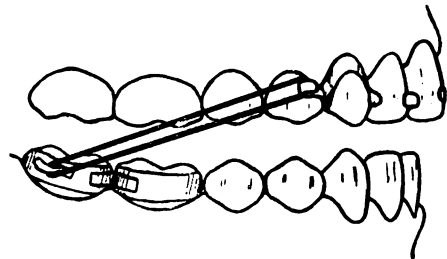


sioned by the extraction of bicuspid, the labial retainer should carry thin No. 19 tubes soldered to the linguo-distal borders of the canine bands as shown in Fig. 4, for the purpose of attaching the appliance to the molars, either at the start or upon the first indication of a return movement. The traction bars are of either No. 19 or 20 German silver, provided with distal nuts, as shown in the drawing, or preferably with mesial and distal nuts, to firmly lock them in the lingual tubes attached to gold molar bands. This will enable one to keep all interproximal spaces closed, and if at this time the occlusion be perfected, it will be found sufficient. In many cases in which the age of the patient and the position of the teeth, etc., favor permanence of retention, the lingual bars and molar bands are not at first attached, though the lingual canine tubes in these cases should always be placed in the construction, to be employed if found necessary. These tubes being small and lying close to the gum, when properly finished give no irritation or annoyance.

INTERMAXILLARY RETENTION.

In cases which are purely protrusions of the upper teeth, to the extent that the buccal cusps interdigitate fully the width of a bicuspid in front of a normal occlusion, and which should usually be corrected by the extraction of the first or second bicuspid, the buccal teeth in the course of the operation—if employed as the sole anchorage force for retruding the labial teeth—may be forced slightly forward of an interdigitating occlusion, and then, if employed as in Fig. 4 as the sole means of retention, will tend to be dragged farther forward by the reacting force of the front teeth. Or it may be one of the many cases in which in its original state the upper teeth in relation to the lower teeth were protruded, perhaps to the extent of a full width of a bicuspid, but which according to dento-facial relations was found to be due partially or wholly to a retrusion of the lower denture, and consequently corrected with the intermaxillary force without extraction. In both of these events, hooks of No. 28 clasp metal are soldered to the labio-distal surface of the canine bands, and formed to protect the bicuspid from

FIG. 5.



the action of the elastics, as is shown in Fig. 5.

In all cases where the intermaxillary force has been extensively employed for the disto-mesial correction of malocclusion, nothing but a continuation of this character of force in a milder degree seems capable of retaining the position gained, notwithstanding the fact that the teeth at times have been brought to perfect or normal interdigitating occlusion.

Moreover, where the final movements for the disto-mesial correction of malocclusion can be accomplished with the intermaxillary force alone, the labial retainer as described may be attached for this purpose as soon as the six anterior teeth are corrected in relation to each other.

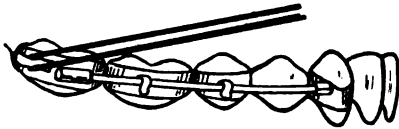
LOWER INTERMAXILLARY ANCHORAGE METHODS FOR RETENTION.

In determining the character of the lower appliances for using the intermaxillary force, warning cannot be too often repeated in regard to the care that should be exercised in the application of a mesial force through this medium from opposing teeth; as the same rules here obtain as in major movements. These are in the main—

First: When no mesial or extruding movement of the buccal teeth is desired, the anchorage hooks for the elastics should be placed at the most distal points possible, and attached to a two- or three-band stationary anchorage. (Fig. 5.)

Second: If a mesial movement be desired and the extruding tendency of the elastics be feared, the intermaxillary hooks should be attached to the most

FIG. 6.

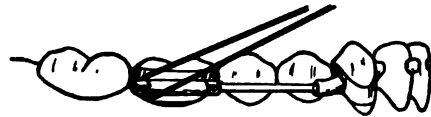


distal points of single molar bands—preferably to the second molars—which are anchored down with No. 19 or 18 bars, the distal ends of which rest in short tubes upon the anchor molars, and pass forward, under hooks or through short open-tube attachments on the first molars and bicuspid teeth, to rest upon the canines. (Fig. 6.) All of these bands should be as thin as the desired strength will permit. With this combination the extruding force upon the anchorage will

be inhibited by distributing the extruding force to all the buccal teeth, while a mesial tipping of the crowns will be permitted through the possibility of the contact points sliding upon each other. If an arch bow be employed instead of the bars, the incisors may also be attached to it if desired.

Third: If the extruding movement be desired, following the correction of

FIG. 7



a short or close-bite malocclusion, the elastics should be attached to the single *first* molar bands or to the crowns which were employed to open the bite, and the balance of the apparatus so arranged as to distribute the force to the bicuspid teeth. In a large proportion of these cases the lower arch and mal-aligned or mal-turned incisors have been corrected, demanding the employment of the six-band labial retainer. In these instances it is frequently desirable to directly connect the lower labial retainer to the intermaxillary anchorages, which enables an even distribution of the protruding force to the lower front teeth and a complete relief to the bicuspid area, so that these teeth will not be crowded out of line by contact pressure. This is one of the common methods employed by the author in the mesial action of the intermaxillary force upon the upper or lower arch when the front teeth are in alignment. (Fig. 7.) To the labio-distal surfaces of the canine bands of the retainer are soldered flattened tubes which are bent to receive the mesial ends of No. 18 or 19 bars, the distal ends of which are locked, with mesial and distal nuts, in buccal tubes upon the first molar bands or crowns. When the intermaxillary elastics are looped over the distal nuts, or attached to special hooks, the force may be distributed directly to the labials in phalanx.

The bars may also be employed to correct or retain the bicuspid.

The most common malocclusion, for which the intermaxillary retainer is especially applicable, is that in which the upper buccal teeth have been moved distally, and the lower have been moved mesially to a normal occlusion, and corrected without extracting. If the forward movement of the lower teeth has not been sufficient to produce an abnormal labial inclination of the front teeth or to force them out of alignment, the intermaxillary buccal anchorages for elastics to the upper labial fixture, as in Fig. 5, will usually be found sufficient to retain the occlusion, though when a still further forward movement of the lower teeth is desired, the methods shown in Figs. 6 or 7 will be indicated.

Where the lower teeth have been moved forward considerably with the intermaxillary force, it is presumed that the incisors have usually in movement been kept bodily in an upright position with the contouring apparatus. Upon removal of the regulating appliances, the contour retaining apparatus (Fig. 11, described later) should be attached to the lower, in connection with the intermaxillary labial retainer upon the upper. It is perhaps needless to say that when the upper and lower conditions are reversed, the same apparatus reversed will be equally applicable.

The amount of intermaxillary force to be applied during the period of retention should be governed by the needs of the case. It should not be at any time in excess of a force that is sufficient to retain the position gained—that is, providing the teeth are fully corrected when the retainer is placed—as this would necessitate stopping the force every once in a while and allowing the teeth to go back, and it is this swinging back and forth in the sockets that is especially opposed to the formation and solid fixation of permanent retaining alveoli. It is far more advisable that the weight of the elastics be gaged to a degree that will hold the teeth perfectly while they are being worn continuously. Faber No. 5 (ticket rings) are the same size in circumfer-

ence, but only about one-half the weight of No. 6 (election rings), of which single and double are commonly used for regulating. No. 7 (thread bands) are the same weight as No. 6, but being about twice the size will exert less intermaxillary force than No. 5.

I frequently correct the labial malrelations of the arches and place the front teeth in proper arch alignment then make the retaining apparatus as above before the disto-mesial malocclusion is corrected, knowing that the intermaxillary force can be gaged to any degree, and that it will act quite as perfectly in retaining or in moving the teeth, if properly applied, as with the regulating device. The teeth are not so liable to be forced out of alignment, and the appliance is far less conspicuous than the usual regulating appliances; while the rigidity of the retainer, holding the labial curve of the arch in its corrected position, is of the greatest aid in preventing the reactive forces from laterally contracting the entire arch.

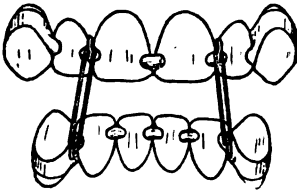
DIRECT INTERMAXILLARY RETENTION.

The correction of extensive open-bite malocclusion has always been the most difficult to retain of any of the characters of irregularity, because of the impossibility in most cases to obtain a stable hold upon which to anchor the retainer that would successfully combat the force of reaction. Where a lingual or labio-buccal bow is anchored to the molar teeth for this purpose, the reactive forces upon the open-bite labial teeth tending to intrude them will usually force the distal extremities of the bow and anchorages in the opposite direction, extruding the molars, which in itself will open the bite still further, as any movement at this point will be magnified in its action upon the front teeth. The intermediate teeth also, which are employed in this method as fulcrums to the elastic force of the bow, are frequently intruded.

These difficulties are now overcome by soldering small spurs to the upper and

lower labial retainers, as shown in Fig. 8. To these are attached direct intermaxillary elastics by the patient, which are worn continuously at all times when not interfering with required functions. This force should be continued until the

FIG. 8.



forces of reaction are completely overcome. As a large proportion of these cases are mouth-breathers at the time of the operation—the habit having continued long after the causes are removed—the elastics also subserve the purpose of aiding the patient in overcoming this unhealthy habit.

OCCIPITAL RETENTION.

In the correction of many cases of decided upper protrusions—especially those in which the incisors are in an extruded position and thus in unpleasant evidence in relation to short upper lips, and particularly in close-bite malocclusions—the

FIG. 9.



occipital force, with its backward and upward direction of movement, has proved an indispensable auxiliary in the author's practice. Again, in the correction of open-bite lower protruded malocclusions, the occipital force applied to the lower labial teeth is one of the most valuable and effective forces for closing the bite, and for aiding in the retrusion and extrusion of the labial teeth after the extraction of bicuspid.

In both of these characters, the tendency of the reactive forces is often difficult to overcome for a time with den-

tal retainers alone. Nor does one always obtain the full desired results of these movements at the time when everything else is finished and ready for the usual retaining appliances. In these cases, therefore, a No. 18 iridio-platinum wire is soldered to the interproximal extensions of the six-band labial retainer, and in such a position as to span the central incisors as shown in Fig. 9. The bar, which crosses well above the medium extension of the appliance, forms a perfect rest for the occipital bow A on the upper, and bow B on the lower. Small rings soldered to the bar on each side of the lips of the rest prevent lateral motion. This occipital apparatus worn at night and with a moderate degree of force will give little or no annoyance, and will exert an evenly distributed force upon all the labial teeth to which the retainer is attached. In many cases for which it has been employed in this way, it has accomplished results that the author believes would have been otherwise impossible.

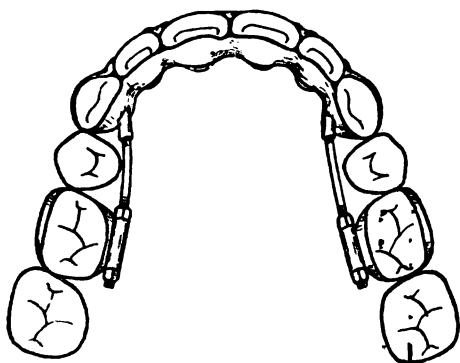
RETENTION WHERE TEETH HAVE BEEN MOVED BODILY.

In the contemplation of retaining teeth which have been moved bodily, the magnitude and peculiarity of the force of a lever of the third kind, which has caused the apical ends of the roots to move, is quite as important to consider as the direction of the movement. The retaining appliance capable of fully sustaining this movement must be one that will forcibly combat the great reacting tendency of the elastic bone-fibers of the alveolar process to return to equilibrium. As this force is exerted along the entire length of the root, it is evident that the stress upon the comparatively narrow zone of the crown which is grasped by the retaining appliance increases as the force approaches the apical end of the root—on the principle that the advantage of a lever of the first kind is increased by lengthening the power arm. Therefore the necessity is apparent, in this character of retention, of employing distally extended arms which are exceedingly rigid in quality, and attachments to the re-

tainer. This is especially true of bodily protruding movements of the labial teeth, which so commonly carry the entire alveolar ridge forward in a manner that could not be accomplished other than by bending and stretching the cancellous structure of the alveolar process at the apical zone of its attachments. With bodily retruding movements of the labial teeth, the obstructing process in the pathway of the moving roots is more largely resorbed, and consequently they are far more easily retained.

When a bodily protruding or retruding movement of the incisors has occurred, which has not been accompanied by a movement of the roots of the canines, the six-band labial retainer, attached firmly as it is to the canines, will greatly aid in retaining the root-movement of the incisors, though it should always be supplemented with rigidly attached lingual bars to the molars. Fig. 10 represents the common retainer employed in these cases. Rigid No. 14 bars are screwed into long-bearing tubes soldered to the

FIG. 10.

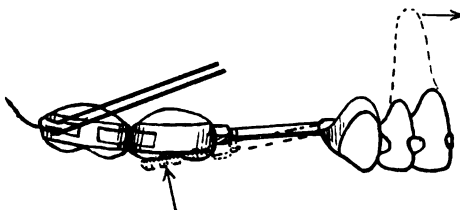


lingual surfaces of the regular six-band labial retainer. The bars rest in lingual molar open tube-attachments with lock nuts to insure stability. In the final assembling and placing of the appliance the bars are bent up or down, so that when sprung into the tubes they will exert a slight extra force upon the roots in the direction of their movement; then the anchorage tubes are closed around the bars and the projecting edges and corners

are smoothed to prevent irritation of tissues. In addition to retaining the teeth, the forces of movement may be increased by bending the bars and turning the nuts.

Where extensive protruding movements have been produced, the incisor bands of the labial retainer should be sufficiently wide to cover the entire lingual surfaces,

FIG. 11.



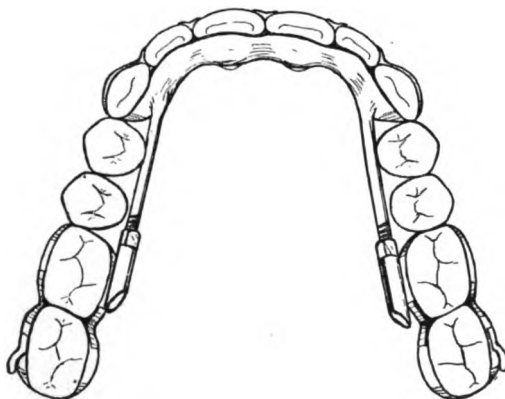
to which they are perfectly fitted, in order to produce a wide and perfect grasp upon the crowns. When rigid bars are firmly attached to these long bearing bands and the ends sprung into open tube-attachments on the molars, they exert a "pull" force at the incisal zone and a "push" force at the gingival zone, which is transmitted to the entire root, as shown in Fig. 11. In connection with this, if the ends of the bars are threaded for mesially acting nuts, the appliance can be made to exert a similar—though less powerful—force to that of the regular contour apparatus. (Fig. 11.) Because of its inconspicuousness it may be preferably employed from the start in minor bodily protruding movements of the incisors: Also in all cases where it seems desirable to remove the regular apparatus before the full completion of its work, it will be found invaluable for holding the position gained and for continuing the movement. This apparatus is described as follows:

The contour protruding retainer shown in Fig. 12 is constructed with a view to combat the reaction of root-movement, also to continue this force, and if necessary the bodily movement to a slight degree. To the lingual surface of the labial retainer, instead of the usual enforcement plate, is soldered a German silver or, preferably, a clasp-metal wire bow, No. 13 or 14. The contact surfaces of

the bow are filed to fit the lingual surfaces of the bands. In attaching the bow to the labial bands an abundance of solder should be flowed well over the lingual surfaces of the bands to reinforce their stability and to remove from the surface irritating prominences. The distal ends of the bows are threaded to lie in open lingual tubes upon molar anchorages, which are provided with buccal intermaxillary hooks. The same care should be exercised in fitting the bow to lie along

final placing, while the protruding force will be otherwise controlled by the nuts at the mesial ends of the tubes. If at any time it is desired to increase or reduce the protruding force upon the roots of the labial teeth, the bow can be easily bent with the curved wire benders shown elsewhere. The intermaxillary force is an important auxiliary in sustaining the stability of the anchorages, and as an aid toward a general protrusion of the upper teeth and retrusion of the lower.

FIG. 12.



the lingual surfaces of the teeth, and the ends to lie evenly in the tubes, as was described in fitting the power bow in the regular contour apparatus. Finally, with this apparatus the ends of the bow are bent, at the points where they join the labial retainer, toward the occlusal plane (see Fig. 11), so that in the final assembling after the cement has hardened, the ends are sprung toward and into the open tubes, which are then closed around them. The distal ends of the tubes and bow should be beveled and finished to present no irritating surfaces.

In Fig. 11 the bicuspid are removed from the drawing to show the lingual bars. The dotted lines and arrows indicate the principles of action. It will be observed that the spring of the bow, in combination with the rigidly attached labial retainer, is calculated to exert a protruding force upon the roots. This force will be in proportion to the amount of bend that is given to the bow in the

When this apparatus is employed principally for bodily protruding the incisor teeth—as it may be in all minor cases, with the view of subsequently forcing the canines and first bicuspid forward by inclination movement with push bars from the anchorages, or with the production of a mesial movement of all the buccal teeth with the intermaxillary force—the incisors should first be placed in relative alignment, and the four-band labial retainer should be constructed with the lingual bow attached, etc., as described above. If the canines and first bicuspid are to be moved forward with the view of inserting an artificial bicuspid to sustain the arch, buccal tubes should be soldered to the anchorages for No. 18 push bars, to be employed for this purpose later in the operation.

The unusual enthusiasm in the practice of orthodontia which has arisen in the past five years—largely through the recently created impression that the regu-

lation and retention of teeth is an operation that can be easily accomplished with very simple appliances—has perhaps by this time become somewhat cooled under the tests of experience, and therefore we may hope for a more willing acceptance

of long-tried principles and methods, which because of their greater complication appear to demand a higher order of mental and physical training, but which I am sure will be found in the trend of true success.

THE PORCELAIN ROD IN DENTISTRY.*

By GEO. B. MITCHELL, D.D.S., Buffalo, N. Y.

(Read before the Dental Society of the State of New York, at its annual meeting, held at Albany, N. Y., May 11, 1906.)

THE subject of porcelain has been the leading topic at dental meetings and clinics during late years—to such a degree that many present may, no doubt, think that the field of porcelain obturations has been thoroughly and exhaustively covered the world over. Yet porcelain work today is enjoying but the childhood of its existence.

It is granted by most of us, I trust, that porcelain operations have been definitely accepted as a valuable and an obligatory branch of dentistry. Thousands of our profession are marching onward with the work, and hundreds are actively engaged in experimental studies; and it is without question that no branch of our professional calling has called forth such an abundance of consideration as has porcelain work in its many forms. Especially is this evident when in addition to our own professional enthusiasm we consider the amazing amount of knowledge of this work and its esthetic results, shown by the laity, and their demand for it.

In an exhaustive reading of society proceedings, society papers, and journals, and in attendance upon many of the important meetings of the East, during the past five years, the writer has discovered that with all our eagerness for porcelain data, the profession as a whole has not been brought in touch with one of the

most valuable aids in porcelain obturations; namely, the system of round porcelain rods for the filling of *certain*—yet numerous—cavities found in the *dentes adulti*; the matrix-fused porcelain being the only method which has engaged our attention to any extent.

General considerations. The porcelain rod inlay differs from the fused porcelain inlay in these particulars: No matrix or special model is required; the work is perfected in the mouth, the original model. The bur last employed serves as the model, and the contour is obtained by grinding away the surplus after cementation. No furnace for baking is required; the porcelain is already fused. Also the greater ease of preparation of both cavity and inlay.

Advantages. It may be advisable at this point rather than in conclusion, to note the cardinal benefits which this system renders, which, you will see as we progress by means of the charts, are present in each and every operation.

First: The cavity preparation in this system is an absolutely perfect cavity preparation, as our standard of today informs us—namely, a flat base with parallel or nearly parallel walls. We all know the first requisite for success in porcelain work is proper cavity preparation.

Second: The porcelain rod inlay, in

*Many of the illustrations accompanying this paper have been reproduced from the issues of Ash's *Quarterly Circular* for 1904.

cases where its employment is permissible, is not surpassed by any other method in operative dentistry, as regards esthetic appearance, simplicity of construction, and security.

Third: In its place, it is the most rapid and accurate method, producing the most satisfying results of any operation with which we have to deal.

Fourth: The cement line is practically nil. The writer has seen many a finished operation in which he doubts if the binocular microscope could find a cement line, although Dr. Joseph Head in relating his experiments tells us that the complete obliteration of this line is impossible. The reason for this "no line" will be shown later.

The foregoing statements are strong ones, but the writer feels sure that you will substantiate these claims as we proceed to the end of the paper; if not then, surely after having experimented with this procedure.

The only great drawback from making the porcelain rod the ideal filling of today is the limitation in the situations where it can be inserted.

Acknowledgment. Dr. Alfred Guttmann of Potsdam, in a very able manner (see Ash's *Quarterly Circular* for 1904) has covered this field exhaustively, and it is with his very kind permission that I draw upon his essay and correspondence for a large part of this paper.

History. Ground fillings date as far back as 1820, when Linderer endeavored to insert ground fillings in the teeth. For this purpose pieces from the tusk of the walrus and hippopotamus were ground to approximate the cavity preparation, and then pressed into place; the saliva coming in contact with the stopper made it swell, thereby perfecting the marginal closure and security of the plug. This method in later years received severe condemnation; the subject will not here be discussed.

Later, the grinding of porcelain tips and pieces from artificial teeth was recommended in 1855 by Volk, followed

by Wood, Hickman, and finally Dall. This method is familiar to all, and is used in some cases at the present time, but it is a laborious process.

To facilitate and simplify the shaping and fitting of porcelain pieces, the use of fused porcelain inlays and rods was later inaugurated by Dall. How, Sachs, Pierre Robin, Allen, and Guttmann have each a method of his own, and it is in the development and consideration of their respective methods that the writer begs your indulgence.

Dall's Method. Dall first facilitated the manipulation of porcelain pieces by constructing round, square, pear-shaped, oval and other forms of fused porcelain rods—thereby approximating the cavity outline more closely—and finished by grinding the inlay, cavity, or both, until adaptation was perfect or nearly so.

Fig. 1 shows Dall's manufactured rods—A, for cavities at the cervical border; B, C, D, for cavities in the labio-distal and labio-mesial surfaces; E, F, G, H, for cavities in the labial, buccal, and occlusal surfaces.

Dall's further improvement was to prepare every cavity circular, thereby facilitating the operation and systematizing the result by using circular porcelain inlays exclusively.

Dall's method consisted, first, of twenty-five circular tapered burs (Fig. 2), the sizes being graduated one to the other: Secondly, a gage in which there was a series of holes, each numbered hole corresponding to the respectively numbered bur, which will fit it accurately. (Fig. 3.) Thirdly, specially manufactured circular porcelain inlays, in two thicknesses, shallow and deep, varying in shades. These inlays are cross cut on the bottom for cement retention, the deep ones having in addition a gutter around them near the base, providing additional anchorage. (See Fig. 4.) A stud on the outside facilitates handling.

Technique. The technique, which is nearly the same in all methods, consists of the removal of decay, approximating

at the same time a circular form, starting with a bur either just the size of the excavated cavity or else smaller, and gradually increasing the diameter by the

edly due to the immense number of prepared inlays of various colors that one would of necessity be required to have on hand—some hundreds, in fact, to have

FIG. 1.

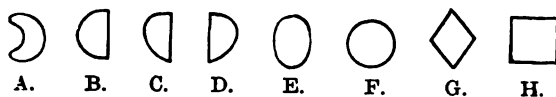


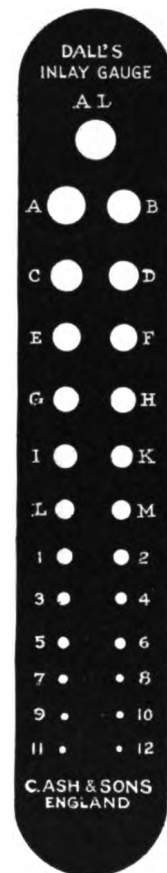
FIG. 2.



FIG. 4.



FIG. 3.



respective burs until the proper outline is obtained—namely, upon sound tooth-structure. The bur must be held *positively* at right angles to the floor of the cavity. The last bur used gives the size of the inlay needed, via the gage. The cavity is undercut and the inlay cemented. Dress down the excess of inlay and cement, at the next sitting.

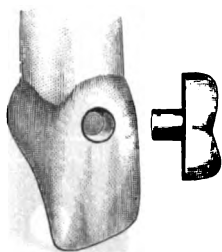
The non-use of this method is undoubt-

an assortment of any value. Coupled to this is the fact that the manufacturers have not aided us by stocking a proper supply (perhaps for the same reason), and one must necessarily send to England for replenishment.

How's method. The cavity preparation is the same as in the previous method. The inlay, however, is ground from a porcelain tooth, of the proper

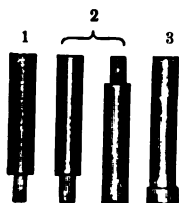
shade, to approximate the circular cavity. (Fig. 5.) This piece is shellacked to

FIG. 5.



a metal mandrel fitted in the handpiece and allowed to run over a carbo file until quite round (Figs. 6 and 7), when it is

FIG. 6.



cemented as before. Objections are the length of time consumed in the manipulation and the two or three sittings necessitated.

is a more expeditious operation, but also requiring dexterity and attention.

Pierre Robin's method. The instrument outfit for this method consists of eleven cone-shaped burs, to be used in the straight and right-angle handpieces. Arranged in consecutive order endwise against one another, they form a cone—the thickest part of the smallest bur corresponding to the thinnest part of the next larger one. (Fig. 8.) The curve $a-b$ shows the size of bur No. 1; $a'-b'$, bur No. 2; $b-c$, bur No. 3; $b'-c'$, bur No. 4, and so on.

Porcelain rods are made to correspond to this cone, being so formed that each bur corresponds to some one part of each rod.

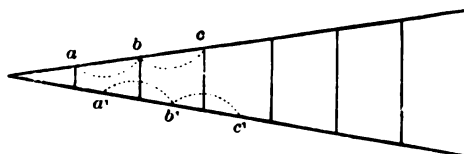
This is the first introduction of the

FIG. 7.



fused circular rods, and Figs. 9 and 10 show some of Robin's cavities. In these figures we cannot agree at points x —as the enameled rods would be so under-

FIG. 8.



Sachs' method. This differs from the foregoing only in the fact that the inlay is ground on the lathe-stone. It

mined as to be extremely dangerous. It can be advantageously used, however, as in the Guttman method and with the

Dall gage, as will be seen later. In Fig. 11, cross section, all the walls are

ning to a cone, very gradually increasing in size; the large end of one bur corre-

FIG. 9.

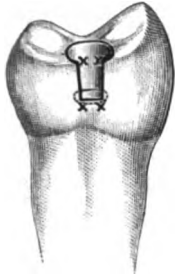


FIG. 10.

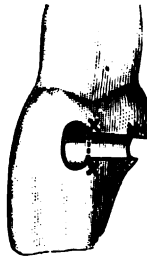
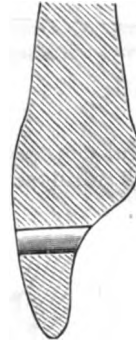


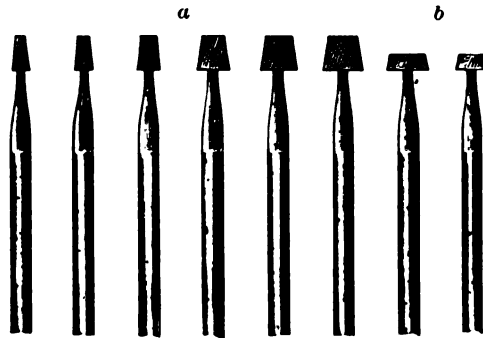
FIG. 11.



intact, and in such pitted teeth (hypoplastic and rhachitic teeth) this is the ideal filling, the cavity passing through the lingual wall. We will see later how Guttman improves upon this.

sponding to the small end of the next bur, and so on. In manipulating the burs they should be allowed to feed themselves, no pressure being exerted, cutting at short intervals rather than steady

FIG. 12.



Guttman's method. This is an improvement on all preceding methods, with one small exception, as Allen's, to be shown later.

The burs are shown in Fig. 12, *a*, in contradistinction to Dall's, *b*, by being longer—thereby more accurately producing good margins in deep cavities. The burs, circular in form, are finely cut as a finishing bur, having flat base and run-

pressure, and above all—avoidance of any lateral deviation, which would destroy the circular form desired.

Fused porcelain rods, ground-edge finish on the periphery and of mathematically trued circular form running to a point, are used, as Fig. 13. They are made of Ash's porcelain body—with the value of which we are all well acquainted. Guttman says of it, "The manipulation

of this material is incredibly easy. It can be ground and cut without requiring polishing; the reason for this lies in

FIG. 13.



the beautiful dense structure, which also causes such fillings to look exceedingly pretty."

Cavities. Guttman classifies his fillings into three classes:

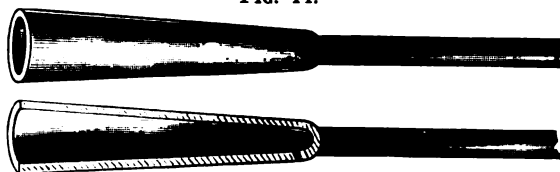
(1) The central ground filling—namely, where a complete circular margin prevails, as Fig. 15.

(2) The nearly central filling—namely, the margin formed is more than a semicircle, as Fig. 16.

(3) The non-central—namely, the margins are a semicircle or less than a semicircle, as Fig. 17.

In Fig. 18, where the cavity overlaps the area of change of color present in the natural tooth, it is difficult to ob-

FIG. 14.



Allen's system. Here let me deviate somewhat. The Allen system is practically the same as Guttman's, except that

tain satisfactory results unless the skill of the operator allow expertness in the manipulating of different colored ce-

FIG. 15.

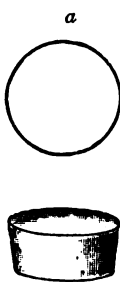


FIG. 16.

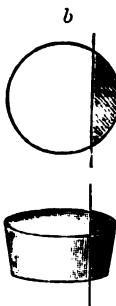


FIG. 17.

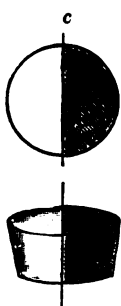
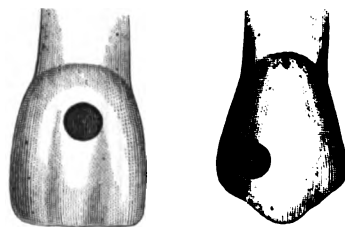


FIG. 18.



it furnishes rods which are not mathematically trued (trued rods can be purchased, however), and for truing the same, or for porcelain pieces, Fig. 14 shows the holder, and Fig. 19 the trephines, graduated in size, furnished to do this and produce at the same time the necessary ground edge. Carbo powder is used in grinding.

The Dall gage, already shown (Fig. 3), is used in each system.

ments, or the use of trephines (Fig. 19) in cutting out shaded portions of an artificial tooth. In molars and bicusps (Fig. 20), how much better than an amalgam filling, the usual procedure!

It is my belief that in Figs. 21 and 22 the use of this system is questionable, as the amount of undermined enamel rods presents a dangerous feature. Above all other points in porcelain work we must be conservative, and the writer has been conservative enough to leave this stage untried. It is, however, used considerably abroad.

In addition, cavities where rhachitic teeth are present, as Figs. 23, 24, and 25, are most efficaciously filled as in Fig. 23, cross section. For such cavi-

COLOR.

Note if the inlay is to face the light or away from the light. Buccal and

FIG. 19.

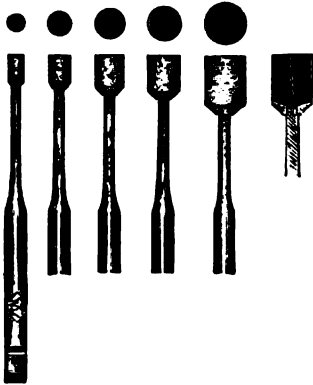


FIG. 20.

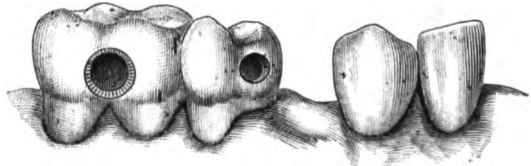


FIG. 21.

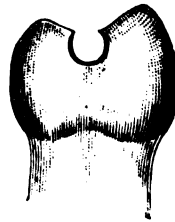


FIG. 22.



ties this is the only filling. No other filling is so simple, so permanent, so secure, or so tooth-like in appearance. If nowhere else, this is a valuable point for

FIG. 23.



FIG. 24.



FIG. 25.



this method. Fit the rod in the prepared cavity, mark each side (labial and lingual), cut off, groove interior, and cement to place. For this cavity preparation Guttman has given us burs as shown in the first bur in Fig. 12. The use of the rods in cases shown by Fig. 10 is again questionable. Approximal wall not intact.

labial inlays, offering one surface to the light, should exactly match the natural tooth.

In cavities on the mesial side, offering two surfaces to the light, a darker shade must be chosen; if away from the light, a lighter color. Ground porcelain fillings, not having to be "fired," never change color as selected, and if we match

FIG. 26.



FIG. 27.

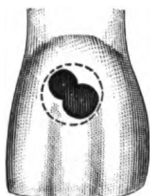
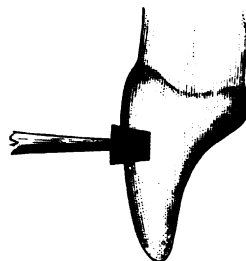


FIG. 28.



the color of the tooth alone, no matter what the position of the cavity, we achieve surprising results.

The rods may be cut up into inlays of varying thicknesses and kept in boxes ready for use. (Fig. 30.) Fig. 31 shows

FIG. 29.

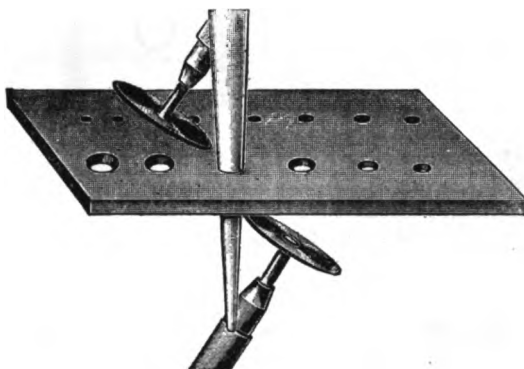
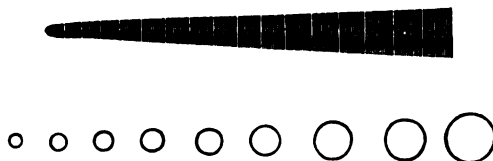


FIG. 30.



TECHNIQUE.

The technique is well illustrated by Fig. 28. The rod is then placed in the gage, as Fig. 29, nicked on each side or marked by pencil, and cut from the rod.

—*a*, cavity; *b*, depth of bur penetration; *c*, depth to which the inlay should go, and *d*, the finished inlay.

The inlay is ground on the base so as not to touch the floor of the cavity. This insures perfect marginal closure when in-

serted, the inlay fitting perfectly, and if all be correct, theoretically at least we

The inlay prepared, the setting of it is greatly facilitated by shellacking it

FIG. 31.

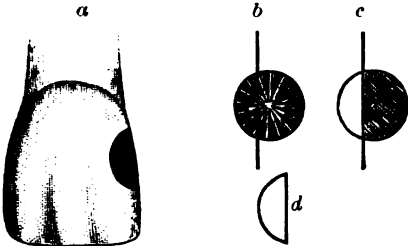


FIG. 32.

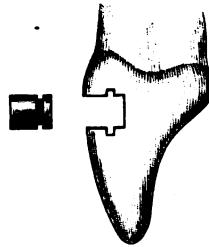
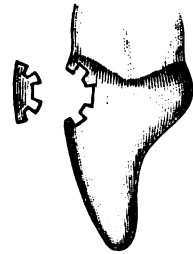


FIG. 33.



should have no cement line. The cement is cut off as by a sharp knife.

The base of the inlay is grooved, for

to a bur end, as Fig. 36, lessening the liability—as when pliers are used—of its slipping away at the critical moment.

FIG. 34.



FIG. 35.



central fillings, as Figs. 32 and 33, for thick inlays, and Fig. 34 for thin inlays.

Fig. 37 shows the proper stones to use in removing surplus; which, by the way,

FIG. 36.

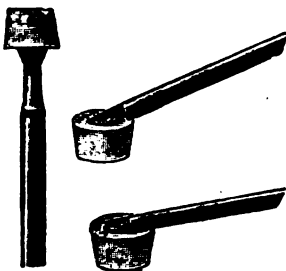
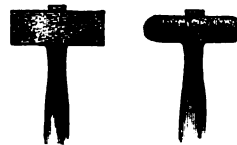


FIG. 37.



Always be positive to introduce cement into the cuts before inserting the inlay into the cavity.

Fig. 35 shows grooving for non-central cavities.

should not be removed until a subsequent sitting; if this be not possible, then not before one and a half to two hours, as there is great danger of dislodging the inlay or tipping and fracturing the edges.

Fig. 38 shows proper stones to produce fissures, etc. A polish by finer grits is not absolutely necessary, as the dense structure of this porcelain, when wet with saliva, produces a very fine result.

FIG. 38.



mal cavities. It may be extensively used in the sulci of bicuspid and molars.

In conclusion let me say: To judge if these theories or methods hold good in practice, one must give them a thor-

FIG. 39.

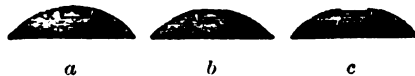


Fig. 39 shows, at *a*, proper, and at *b* and *c*, improper contour to be the result of grinding.

In a set of thirty-two teeth this system may be conservatively used in eighty-one distinct cavities, not counting approxi-

ough and not an indiscriminate test. The value of this method is greater than one may think, and grows larger by usage. It is simple, accurate, rapid, and scientific, producing *in its place* most beautiful results.

GOLD INLAYS.

By W. B. DILLS, D.D.S., Brooklyn, N. Y.

(Read before the Dental Society of the State of New York, at its annual meeting, held at Albany, N. Y., May 11, 1906.)

IT is with some fear and trepidation that I come before you to present radical and contradictory methods for the preservation of teeth from the ravages of decay. Realizing fully the importance of the manipulative art, which has made American dentistry what it is today you can understand why I, as a young member of this honored profession, should hesitate when I assume to cast or throw aside the keystone to the arch of our temple, and presume to substitute for it a new and more practical key for the maintenance of the arch—namely, that of zinc phosphate over gold foil.

We all know that, in the past, the pioneers in dental art were the men who could manipulate gold foil for the successful restoration of lost tooth-structure; and this was carried so far that success

was largely gaged by the ability to handle soft or cohesive gold for the substitution of lost tooth-structure. That this has been and is generally accomplished is beyond a doubt; but that this accomplishment is the best method for the preservation of teeth in the human anatomy is an open question, and as an individual having only limited experience, I can but feel that it is far from the true and scientific solution of the problem.

In the first place, we are educated for the practice of this our honorable profession in order to save and make useful those organs of the oral cavity with as little pain, suffering, and discomfort as possible to those who place themselves under our care. This being the case, we must take into consideration all the advantages and disadvantages, not only to

the operator but to the patient. And it might be well to consider at this time the advantage to the operator, admitting this preference to be selfish.

I doubt if there be one person present who will not concede the fact that a method to be accepted must possess the marked advantage of being either a time-saving or a remunerative process. As an illustration, we will take a lower first molar, with a mesio-approximal occlusal cavity. If the wall of the cavity be of good strength, the restoration may be accomplished with foil and mallet, with perfect satisfaction to both operator and patient, in from one to three hours' time—admitting that the condensation of the foil is perfect.

The finishing details being accomplished, we still have, however, staring us in the face the worst feature as to stability—namely, that of the molecular change in the filling by the constant stress of mastication, which forces the foil to the periphery of the cavity, and ultimately causes the fracture of one or both of the walls supporting it. This may happen within a few months or within a few years, but the result is the same; the operation has to be renewed and enlarged, and as it was in the beginning, so it will be in the end. Now, how are we to overcome this difficulty? I know of no easier or simpler method than by the insertion of a good practical inlay.

I feel that we are deeply indebted to Dr. N. S. Jenkins of Dresden, Germany, for his solution of this problem, in that he has devised a means by which zinc phosphate—which is beyond a question of doubt the most reliable filling for teeth, when properly protected—may be used with assurance of success. And while I am presenting to you a method for the protection of such fillings with gold, it is a question whether porcelain would not be just as efficacious. This is one of the problems that must be solved by the individual from practical experience, and I sincerely hope that my efforts to present this subject to you will be productive of a discussion which will go far toward its final solution.

But of one thing I am perfectly convinced, and that is, that gold foil and the mallet are things of the past and not of the future. This is the conclusion which led me to state in the beginning that I came before you with fear and trepidation; while I want to assure you that I have the courage of my convictions, and place myself on record as one of the first to accept and advocate the new art for the salvation and restoration of the teeth.

This matter has seemed of such importance that I have given a great deal of time and attention to the best possible method of producing a protection to a zinc phosphate filling, and I would present on this occasion a method which to me has proved more than satisfactory. If you can offer any suggestion for its betterment I shall feel that I have been more than repaid for my small efforts in bringing this subject before you. The following is a detailed description of my methods of making gold inlays:

I have found that platinoid, No. 30 to 28 gage, makes a most excellent cup or form for the retention of the impression material, after preparing the tooth with suitable draft for an impression and the proper setting of an inlay. The platinoid can be easily cut to shape with an ordinary pair of scissors, and bent so as to conform to the contour of the particular requirements. The "Perfection" compound is used, as manufactured by the Detroit Mfg. Co. It is first rolled into pencil or stick form, which permits of cutting after slight warming. The platinoid having been cut and bent, it should be heated in the alcohol flame, so that the required amount of the compound can be made to adhere perfectly to its surface, so that when withdrawing the impression the two will come away together.

In cases that have been protected by the rubber dam—the cavity of course having been prepared with suitable draft and coated with vaselin—the cup and compound may be removed without the slightest danger of any distortion.

Having secured an accurate impression in this way, it is invested in plaster, the

surfaces of which are exposed, that amalgam may be packed and burnished into the mold, resulting in a practically perfect reproduction of the cavity. The amalgam should be mixed thin, and the mercury worked out as you are filling in the mold, and allowed to stand over night. This amalgam die is taken out of the plaster and embedded in a composition called "dental lac," contained in one of the cups which belong to the Brewster so-called water-press.

Now adjust a piece of pure gold of No. 34 gage over the die, press it down into the cavity with a piece of spunk, and burnish. Take it out, trim and anneal it, and replace on the amalgam die. Put a piece of spunk in the center, place in the press and swage, and trim to about 1 mm. of the cavity margin; then anneal and swage again.

Fill the matrix with any quick-setting cement. I have a quantity of Archite cement left over, and I think probably there are others who have some also. It sets and hardens quickly. (By the way, that is the only purpose for which Archite has any value, so far as I know.) After filling the matrix with cement, place it in the cavity and instruct the patient to bite while the cement is still soft. Take it out and trim to contour, and around the edge trim below the enamel margin to about the thickness of the piece of gold that you are to swage for the top cap. Replace it on the amalgam die and swage the top piece of No. 36 gage pure gold; trim away to the line where you are to unite the two pieces, anneal, and re-swage.

I separate the two pieces, and usually find upon tapping the matrix that the cement will drop out very readily; if not, catch the matrix with the foil-carriers, and tap them once or twice. The cement will drop out whole, so that you may have it at any time to straighten out the cap if distorted in any manner.

I cut out of the matrix one-half or more of its center, keeping away from its margin in accordance with the shape of the cavity. In cutting this hole the matrix becomes somewhat distorted; I anneal it, replace it in the amalgam die, and burnish well to place; take out again and anneal, place the cement core in position, and re-swage; remove the cement core, and unite the two pieces over the Bunsen flame—at one point only—with 22-k. solder and a little powdered borax. Try it in the amalgam die, and see that the two pieces have a close contact all around. Then finish with 22-k. solder, and fill in with any low-karat solder, leaving enough space inside to act as an undercut in retaining the filling.

Set it in the tooth and allow the cement to harden. All that now remains to be done is to run a disk over the edges, and polish with a brush wheel.

I have found this method applicable to the deciduous as well as to the permanent teeth, and particularly advantageous in that it eliminates the long and tedious operations necessary for the introduction of gold foil. It also eliminates or relieves a child of the fatigue and discomfort of sitting an unnecessary long time with the rubber dam in position.

There are many other advantages that might be claimed for this or any of the methods of obtaining a perfect gold inlay, but these I must leave for your own deduction, only adding in conclusion that I sincerely hope you will find enough in this short paper to provoke a discussion which will bring out whatever good qualities this method may possess, as well as the advantages of the several different methods.

I beg you to accept my sincere thanks for your kind attention and courtesy, and my assurance that I much appreciate the honor of having been selected as an essayist of the Dental Society of the State of New York.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-eighth Annual Meeting.

(Continued from vol. xlviii, page 1214.)

SECOND DAY—*Morning Session.*

After some routine business had been transacted,

The next order of business was the reading of a paper entitled "The Porcelain Rod in Dentistry," by Dr. GEO. B. MITCHELL, Buffalo, N. Y.

[This paper is printed in full at page 31 of the present issue of the COSMOS.]

Discussion.

Dr. J. Q. BYRAM, Indianapolis, Ind. Dr. Mitchell has given us a very elaborate *exposé* of this subject, and I feel that his position is one that needs but little defense, yet it is one that is open to a great deal of criticism. I am always glad to admit it, when I find someone more skilful than I. Anyone who can take burs and manipulate them in cavities on the buccal surfaces of molars and bicusps, or even on the labial surfaces of the incisors and canines, and prepare them so that they are absolutely the size of the bur, I am frank to say can do more than I. I never saw a skilled machinist attempt to drill a hole without first placing the work in a lathe or similar apparatus where he would have every mechanical assistance, and it seems quite impossible that we can take burs in right-angle handpieces and drill a hole—if I may so call it—so that the diameter of that cavity in any direction will be absolutely the same as the diameter of the bur. If it were possible to do these things, I grant you that the porcelain

rod would have great value in such cavities.

Dr. Mitchell makes the claim that many times the margins are invisible. I have seen a few inlays constructed by the process of burnishing in the matrix where the margins were invisible. But they are exceptions, and I think the doctor will have to admit that it is the exception rather than the rule, where he has invisible margins by this method. One of the first criticisms would be upon the cavity preparation of this system. I am sorry that the doctor did not go into the technique of cavity preparation and tell us how to prepare the cavity represented in Fig. 31, and how he prepares the rod so that it absolutely fits that cavity. I am frank to say that I cannot do it, and it seems to me that in most cases the time consumed in such operations would be greater than that occupied in burnishing the matrix and fusing the inlay. It is not the little inlays that bother us most, because they are comparatively few. I believe in the majority of cases we do not have small cavities like those represented here, and if your patients in the East have this form of cavities you are more fortunate than we are in the West. We find that the cavity not only involves the middle third of the tooth, but extends in one or both approximal directions. If it were possible to find more of these smaller ones, this system would probably be of great value. I have discontinued preparing most small cavities in circular form, and I believe there are good reasons for it. In the first place,

a circular filling does not give the same cosmetic effect as where it is prepared in a more irregular marginal form. Another thing: Always remember that the labial surfaces of the incisors and canines, and especially the latter, are curved in both directions, the curvature being greater mesio-distally. In order that we may get the proper depth of the cavity by this method at the extreme mesial and distal edges, it is necessary to grind the porcelain so that it conforms to the shape of the cavity. If this be true, then it seems to me that more time is consumed than would have been the case in burnishing in a matrix and fusing an inlay. But the essayist very nicely gets over this by saying that, where indicated, they make ideal fillings. As he has mentioned it himself, it is hardly necessary for me to dwell further upon that point, because I believe that no sane American dentist would attempt to fill such a cavity as you see represented in the bicuspid, and consider it good practice. I question very much whether this method will do for general practice.

The essayist also speaks of colors being the same. I can hardly understand that. When we take a piece of porcelain in the shape of a cone, made of the same body, using the same pigment, we find a variation of the hue of that color dependent upon the thickness of the mass. Can we expect to take one of these rods, cut off a thin section, place it in the cavity, and then have the same color that we had originally in the rod? This porcelain is translucent just the same as other forms of porcelain, and it would seem that we have the same difficulty in obtaining color here that we have in other forms of inlays. I wish, however, to compliment the essayist, because I think it is a subject well worth bringing to our attention, and one well worth studying. I frankly admit that my experience with the porcelain rod has been limited; I have used it in a few cases, but not to the extent that the essayist has, because I am an advocate rather of the matrix system.

Dr. C. H. BARNES, Syracuse. "A place

for everything and everything in its place." If the dental profession carried out that rule to the letter, what an increase there would be in the number of perfectly satisfied patients. As each new method or material is presented to us we either take it up eagerly to the profit of the manufacturers and overdo it, push our own good judgment to one side, and "Hip, hip, hurrah!" for the new thing in every place, or else, if we have been well bitten a few times, absolutely refuse to have anything to do with it, to the detriment, perhaps, of our patients and practice. It is a matter of individual judgment as to how a cavity shall be prepared and what it shall be filled with, in order to preserve the remaining tooth-structure and make the organ useful and ornamental.

One thing that impressed me in Dr. Mitchell's paper was his illustration of the proneness of some men to use one particular method in every case, from the days of the "Royal Mineral Succedaneum"—when the best gold operations of that day, performed by the leaders in the profession, were replaced by the dental enthusiasts of those days with the simplest shrinking silver amalgam—down through the copper amalgam craze, pulp-capping, immediate root-filling, implantation, porcelain roots, pulp-mummification, great extension, and metallic root-fillings. Do you remember cataphoresis and Archite cement? Now it is inlays, gold and porcelain, Ascher's cement, and somnoform. All of these materials and methods are correct in their place, but not every place is correct for any particular one of them. It is a matter of individual judgment—the treatment and preparation of a cavity and what it shall be filled with—and this judgment is guided by the operator's ability in the use of certain methods and materials, modified by the particular fad with which he is indulging or experimenting at the time. Good judgment is a polite name for common sense or horse sense, which causes a man to do the right thing in the right way at the right time in the right place. The more common sense that is mixed with your

filling material the better; and be careful that it does not burn out when baking the porcelain. I am not deprecating the spirit which impels a man to experiment with a new material or method which some clinician has recommended to be used everywhere every time, with saving of time. He ought to try it. If there be a new method or new material, it is his duty to himself and his patients to learn all about it and use it in its place. I wish the essayist had laid more stress on the selection of cavities for porcelain-rod inlays. I have heard more than one paper on selection of filling materials, but I fail to remember one on the selection of cavities. In this age of advance in the dental profession, the man who gets the "one-filling-material-everywhere" habit ought to have a paper written for his special benefit.

I always had an idea that I could do anything that anyone else could, and I can. I have two hands, two feet, and a reasonable amount of brains, all of which have been in training for several years, so why cannot I perform the same operation that someone else does? I know I can, but I also know that in using the same materials and methods as does Brown, Smith, or Jones, I cannot do so well as they, and if a thing be not done well it is done wrong; therefore it is wrong for a man to perform an operation for a patient that he cannot do well. He should either have better training, or adopt a different method. The natural talents of different men vary not so much in kind as in degree. We all have some eye for shape, form, and color, but how much more easily and neatly will one man make a baked porcelain inlay than another! Without any difficulty he selects just the right color and shade—or knows that if he has not done so he can rectify it before the final bake—gets the contour correct, and when cemented in place his inlay looks as natural as the tooth; and he did not spend an hour grinding off the excess of porcelain, either.

Perhaps I am wandering far from the paper under discussion, but the porcelain rod must go through the same process of being weeded out of cavities not

adapted to it, as has been the case with every other filling material we use or have experimented with. There is a place for each and all of them, though the place for some is not in a dental office, much less in the mouth of a patient. I would suggest to go slowly with most of them. Let someone else have a share of the successes and failures of the newest new. The doctor has given a terse outline of the uses of the porcelain rod for making an artistic and natural restoration of a carious tooth. There is no doubt in my mind that it is better adapted than any other filling material in the case of those rarer circular labial cavities in the anterior teeth. The amount of time required is an objection—generally two sittings. A cavity of that class is the simplest in which a filling can be inserted. Suppose it be a fused porcelain filling and your color is wrong the first time, and you bake two, perhaps three, before you are satisfied; which method has consumed the least time? But if your color and contour had been right the first time, you would have saved an hour on your day's work and finished the operation at the one sitting. In, say, one-quarter and three-quarter circular cavities in the incisive edge, I can bake a more satisfactory piece of porcelain than I can grind in, and in so doing save time. Personally, I find very few cavities in which I cannot use to better advantage some method other than the porcelain rod. Now, that is just a matter of the personal equation, and goes to prove the statement which I made—that I can do anything that anyone else can, but I cannot do it as well if I undertake to use his method.

Every man's judgment, even that of the most fair-minded, is biased by his personal experience. His judgment as based on his knowledge—I use the word in its broadest meaning—being based on the varied views of many men, would be fair and impartial, but his own personal experience will carry much weight in forming his opinion. In dentistry every man must be a law unto himself. Whatever method he adopts let it be that with which he can get the best results. Methods

which appeal to him as time or energy savers he should experiment with, but conservatively, until he is assured of the validity of their claims and their adaptability to his particular manipulative ability.

Think of the pieces of bridge work you have seen in the last twenty years that were failures through bad designing or faulty construction, or that should never have been inserted at all. After all, we learn more from our failures than our successes; but one can learn just as much from the other fellow's failures, and it won't hit him half as hard. Do not understand me as being opposed to every new thing that comes along, for I am not, but I try to go a little slower than the enthusiasts. Enthusiasts are all right for the profession, we need them, but the "conservative" will have less to regret than the "radical." As Dr. Mitchell showed us, some men would use porcelain rods in every possible case—and in some not possible; so some men would use gold, or cataphoresis, or Archite cement, or pulp-mummification, in all cases.

Dentistry is advancing fast, and improving, along with wireless telegraphy and gasoline engines, but do not get so far ahead at the forks of the road that you have to whistle for the rest of the procession to catch up, and then find they have taken the other road because it is better. Make haste slowly, and you will be farther ahead in your profession and stand higher in the estimation of your patients.

Dr. A. C. RICH, Saratoga Springs. I am glad that Dr. Mitchell has had the courage of his convictions. The porcelain rod has a place in our practice. While he brings us nothing new, and makes no pretense of doing so, I feel that he should be commended for re-directing our attention to this subject. The porcelain-rod filling is originally an English method of practice. I think this a result of the fact that they manufactured a porcelain of such perfect homogeneity and coloring that its use as a filling material was practically and artistically satisfactory.

The essayist insists upon the merit

of the method, and doubtless he is right. It probably is a valuable aid in many instances, but the best operators in fused porcelain work, in contradistinction, will be found to be those who give it most attention, because they become more nearly perfect in manipulative ability or technique. Preferably, then, most operators should adhere to one method, thereby achieving greater perfection.

Perfect circles, squares, diamonds, crescents, or other geometrically shaped cavities detract from a perfect operation, because the esthetic eye is shocked by the perfectly regular substitute for lost substance—irregular lines are not so easily discerned.

The contouring of a porcelain-rod inlay after fixation may be the very means of inviting recurrence of decay, by the destruction of the fine edge of enamel. The reasons stated for the non-use of this method are potent. It is unnecessary to enlarge on the points of excellence of the method. Dr. Mitchell should have our hearty thanks for bringing again to our notice the porcelain rod in dentistry.

Dr. R. H. HOFHEINZ, Rochester. No doubt Dr. Mitchell had myself in mind when he spoke of the old gentlemen who would report some of the joyful moments they had spent in making the porcelain-rod inlay, because he saw in my office many of these fillings which I introduced some fifteen years ago, and which are doing good service today. I am quite cosmopolitan in my dentistry, but I do not see how the doctor can enumerate eighty-one different cavities—except those of different sizes—in which he places the porcelain rod. They have certainly great advantages and possibilities. Some say they can put in a porcelain inlay quicker than a porcelain rod. I do not agree with that, unless it be that they choose the wrong place for either one or the other. The porcelain rod in the small circular cavities on the anterior teeth, and particularly upon the lingual or buccal surfaces of posterior teeth, where the color problem does not enter, I think can be inserted much more quickly than any inlay which I, at least,

can make. The greatest disadvantage of the porcelain rod is its lack of variety of colors.

The essayist has laid particular stress upon the fact that the bur should at all times be held at right angles with the bottom of the cavity. That is one of the essential features in the success of the porcelain-rod inlay. If this is not done you will have such an imperfect margin that in time it must fail.

The color problem can be overcome where it is the choice of the operator to use the porcelain rod, say upon incisive labial cavities. I should recommend in this case to grind the inlay to the natural contour of the tooth before cementing. After having it ground very nearly to the contour, drop a piece of hard wax in the bottom of the cavity, insert the inlay, and shape the labial contour. The inlay is then removed, and if it be necessary to get a variety of colors, you can bake a lower-fusing body on the inlay, and get the desired variety of colors very easily.

The question of cementation has been brought up. Not long since I read a paper written by Dr. Head, in which he says that a large body of cement is always necessary to retain an inlay, and I think that the larger the body of cement in the cavity, the safer the inlay is held. For that reason, after the porcelain rod is made, I have been in the habit of making that part which enters the cavity cone-shaped, so that I get more cement in the bottom of the cavity than at the margins.

Dr. Byram has told us repeatedly that he has not seen so many of the small cavities in the West as we see in the East. I do not know why. I meet in my practice with a great many of these small labial cavities. Of course in the West they do things on a larger scale than we do in the East, and it may be that they make these cavities much larger than we do. There is no good reason why, in a tooth which may show a slight line of disintegration in the enamel labially, especially along the gum line, we should not put a small porcelain filling in the cavity proper, whether by the rod or the matrix system, and by rigid prophylactic

treatment keep the rest of that surface free from disintegration by decay. In my practice I have many of these cavities filled with porcelain, and I keep the rest of the surfaces free from decay. It may be that the doctor applies the western degree of extension, and thinks it is wiser to extend the cavity from the mesial to the distal surfaces. Whether that is best I very much doubt.

Dr. Byram has also taken exception to the method of filling these teeth with the porcelain rod. I do not know of any better one, and I will be very grateful to Dr. Byram if he will tell me of it. Invariably such cavities are extremely small, and it is in these small labial cavities where the porcelain rod is best indicated. Did I understand Dr. Byram to say that it would be bad practice to fill a tooth with the porcelain rod as illustrated in Fig. 23?

Dr. BYRAM. I would like to ask Dr. Mitchell if it is intended to show an open space? That is, is the approximal surface involved?

Dr. MITCHELL. No.

Dr. BYRAM. Then I was mistaken. It looked to me as though the hole was drilled through, and involved the approximal surface.

Dr. HOFHEINZ. I am sure you misunderstood the drawing. I think if the porcelain rod has a place at all, it is in cavities of that kind. They are better and more substantially filled by means of the rod than with anything else, because the circumferences of the cavity labially and lingually almost invariably agree, and for that reason you can use the same bur, and have the same circumference of the inlay.

Another cavity in which the porcelain rod is very much indicated is the extremely small cavity that you find on the incisal portion of those teeth suffering from faulty enamel development. These cavities are filled in my office with rods made by myself, not bought.

I think that after all is told the porcelain rod has many excellent applications; places where it can be properly put, just the same as the matrix inlay has in so many other cases.

Dr. MITCHELL (closing the discussion). I think Dr. Hofheinz has ably defended this system, and he has covered the principal additional points which I should have otherwise referred to.

I want to say in answer to Dr. Byram that I do not think I made the statement that this was an absolute method, but I said it was the most accurate of any method which we have. I do not mean by that to intimate that this system can be used everywhere. We see a great many buccal cavities on the molars and bicuspidis that can readily be made round, and most men fill these cavities with amalgam. Now, if you will use the rod inlay instead of the amalgam for such cavities, you will have over fifty per cent. of betterment of the conditions there. As I said in the paper, in its place and used properly, it is one of the most satisfactory methods which are available to us.

The subject was then passed.

A paper was then read by Dr. W. B. DILLS, Brooklyn, entitled "Gold Inlays."

[This paper is printed in full at page 40 of the present issue of the Cosmos.]

Discussion.

Dr. JOHN I. HART, New York city. I can agree with nearly everything Dr. Dills has said, with the exception that I think he is a little enthusiastic when he says the mallet and the foil in their various forms may pass out of use. I think that in the smaller cavities in the back teeth the foil and mallet will always be used, but in the large cavities involving the approximal and the occlusal surfaces of these teeth I am sure that the gold inlay saves the patient, saves the operator, and will save the teeth. We get the density, we get the contour, and we get the margin with infinitely less expenditure of time and energy than we could by malleting-in the filling and having the patient worn out nervously when we are attempting to finish that filling down. I like the type of inlay suggested by Dr. Dills much better than that suggested by Dr. Perry, in that the Dills inlay has a hollow surface on the inner side, which admits of a larger mass of the oxyphos-

phate, thus protecting the pulp from thermal changes if we are working on teeth with vital pulps; and it also gives a better hold to the inlay, owing to the hollowing out on the inner surface. Dr. Dills said that some operators might be able to place a porcelain inlay in the back of the mouth as well as a gold inlay, but I do not think that porcelain is indicated in that part of the mouth, as it is not so strong as the gold inlay.

I can confirm all that he says with regard to its advantages, and his technique of manufacture differs little from my own; and I do not think it would be well at this hour to take up the time of the audience with the technique of making the inlay. All I can say to those who may not have tried the gold inlay is, Try it as soon as you can; and I think you will place the valuation on its merits that it deserves.

Dr. W. D. TRACY, New York city. It is interesting to note the degree of enthusiasm with which Dr. Dills speaks on the subject of inlays. I think we all appreciate the fact that enthusiasm is one of the personal elements that contributes to individual success in any line of work. We also know that a certain amount of conservatism and balance are necessary in the enthusiast, to prevent him from becoming what is known as a crank. If Dr. Dills means us to infer that he has totally abandoned gold foil as a filling material, then I fear he is going to be a crank on inlays. Personally, I feel that there is a large class of cavities which I can fill with gold foil, effecting the permanent salvation of the teeth with no more discomfort to the patient and no greater loss of time than would occur by the inlay methods just suggested, and I believe I shall have a good many supporters in this theory right among the inlay workers.

Do not misunderstand me. I am an ardent inlay worker myself, using both the porcelain and gold inlays extensively, and I have to thank Dr. Dills for many little points of value in the technique of this class of work.

The method of making gold inlays which is going to be of the greatest value

to the greatest number is that method which is most effective in saving time for both patient and operator, and I think I can go Dr. Dills one better in the *modus operandi* in compound inlays in molars and bicuspid. My method is similar to his up to the point of taking the impression of the cavity. When the Perfection compound in its little metal tray has been pushed into the cavity in the tooth, it is hardened with a jet of cold water from the syringe, and left in place a few moments until a mix of plaster is made. Now, with a partial-impression tray adapted to the needs of the case, a plaster impression is taken right over the little compound impression, and the imprint of the cavity proper will come out with the plaster if the cavity has been properly prepared. A wax bite is next taken, and the patient is then allowed to go. Now pack soft amalgam or flow your improved Spence metal, using only enough to give a die suitable to swage upon later. Varnish your plaster impression and run the cast with plaster in the usual manner. When hard, separate, and you have a perfect cast showing the adjoining teeth, and in this cast—as a part of it, in fact—one has the amalgam die which is to be the working model in the construction of the gold inlay. Now, with the aid of the wax bite which was taken at the first sitting, get up your articulation. With this model and articulation the operator is enabled to construct his inlay from start to finish without trying it in the mouth at any stage, and without delay or inconvenience to the patient.

If the details of this method are carefully executed, all you have to do at the second sitting is to cement your inlay and burnish the edges. Please note that there is no guesswork when making inlays by this method, and that the results are more accurate than those obtained by any plan yet suggested for use in the entire absence of the patient.

Dr. H. C. FERRIS, Brooklyn. With reference to taking the bite, I believe that more operators fail on the occlusion from the manner in which the bite is taken than from any other cause.

Many dentists take the bite in wax, and rely on that entirely for the occlusion. We cannot be too careful in that particular. I take an impression in plaster of the lower jaw if the inlay is to be in the upper, and *vice versa*. I also take an impression of the upper in compound, and then use the casts from these two impressions on the bite to articulate the case, and I have been able to get very much better results. That is to my mind one of the vital points in this method.

Dr. R. H. HOFHEINZ, Rochester. Some seven or eight years ago I read a paper on gold inlays. That paper had reference only to inlays on the buccal and labial cavities, particularly where the cement had washed out in hyperacid mouths and gutta-percha was substituted. In that instance I recommended the soldering into the center of those inlays of small metallic pins, pins coming from porcelain teeth. Whether the inlays of Dr. Dills—not being entirely solid—will stand the stress of mastication is a question, to my mind. The pins soldered in as referred to will give you additional strength, and I would certainly recommend these pins, which have proved so serviceable to me in the gold inlays I have spoken of.

Dr. CHAS. F. ASH, Brooklyn. There is one point that I would like to speak of in reference to gold inlays. In the large approximal and occlusal cavities, and in compound cavities in general, I follow the same line of practice as the essayist, but there is a very easy method of putting in gold inlays on occlusal surfaces that has not been mentioned. After preparing the cavity, taking the impression in compound, I fill the impression with Archite cement, which sets very quickly, as you all know. You can separate the impression and the cement very soon. Place a die so made into the swaging press and with a little piece of gold upon it swage a matrix, putting it back into the cavity for a little final burnishing, and then fill your matrix with 22-k. solder or plate. The whole is then put back into the cavity, the edges polished, and the inlay set. The entire operation can be done in about fifteen minutes.

Dr. DILLS (closing the discussion). Dr. Hart spoke of the use of the gold foil in the lower teeth. I would say that I think I have a better filling with a combination of cement and porcelain or cement and gold than you have with cohesive gold.

Dr. Tracy thinks I am enthusiastic in regard to this system. I beg to differ with him. I put gold fillings in once in a while, but for years I have inserted very few. I know I took a very strong stand; I expected to be more severely criticized than I have been; I want to thank the gentlemen for being so lenient. I think Dr. Tracy's method ~~some that~~ simplifies the making of the inlay, because it can be turned over to one's mechanical man.

With reference to Dr. Ash's method, I think there are different methods that are of value. Sometimes, where I have a deep occlusal cavity, I fill in the inlay with 22-k. solder without stopping to swage up a cap.

The Committee on Practice, Dr. E. HOWARD BABCOCK, then read the following report:

REPORT OF COMMITTEE ON PRACTICE.

As I understand it, the Committee on Practice is expected to submit a report covering new appliances, methods of operation, additions to the dental materia medica, or such other subjects as may be deemed of general interest.

When I began to look over the current dental literature, I found in the December issue of the *Items of Interest* an article entitled, "A *Résumé* of the Later Appliances and Materials Used in the Practice of Dentistry." It was the report of Dr. B. F. Gray of Colorado Springs, made to the Colorado State Dental Association. As this report is so complete and comprehensive, it would have been impossible for me to have made a report on the same general lines without covering about the same points, thus laying myself open to the charge of plagiarism. Also the same issue of the *Items* contains a report of the Materia Medica

Committee of the New Jersey State Dental Society. This report is rather full, covering the leading recent additions to our materia medica. Consequently I shall pass over the subjects treated in the above reports, and shall present for your consideration a few of the subjects that at the present time, judging from the dental literature, are uppermost in the thoughts of the profession.

Without fear of contradiction, I shall state that the question of inlays ought to head the list.

It has taken some years for us to begin to appreciate the value of porcelain in our dental work. Of course we have used the commercial porcelain tooth, and getting it so easily, with such a range in size, shape, and color to choose from, we cannot imagine how lost we would be if this supply were suddenly cut off, and we were compelled to fall back upon the old hand-block carvings that we read about in our text-books on prosthetic dentistry. But I refer more especially to the various porcelain bodies that offer such a wide range of usefulness in their application to our daily problems. Those of us who first used the old-fashioned gas furnace, appreciate the boon the electric furnace has been to us, and what a factor it has been in popularizing individual porcelain work.

I shall not enter into a discussion of the proper shaping of the cavity, excepting in the general statement that the cavity should give sufficient ease of access to enable the ready withdrawal of the matrix when formed, and also that it should be so formed that the inlay will have other support against stress and strain than that furnished by the adhesiveness of the cement alone.

Whether to use gold or platinum for the matrix is an all-absorbing question. Personally, I prefer platinum, because it retains its shape better and seldom has to be invested. I use it 1-1000 inch in thickness in the posterior part of the mouth; and 1-2000 in the anterior portion. Investment wastes time, because more time is required in the heating-up and cooling-off processes; and if there

chances to be even a very slight tear in the matrix, there is much lost time, owing to the fact that the investment rapidly takes up the moisture from the body as it is being placed in the matrix.

Gum camphor combined with paraffin seems to make the best material for packing the matrix before removing it from the cavity. Use the paraffin first, following it with pieces of gum camphor crowded in upon it. The paraffin is more adhesive, while the camphor gives stability. Fortunately, both can be burned away without leaving any perceptible residuum.

The lower-fusing bodies seem to allure men on to try their hand at porcelain work; but the more advanced operator, appreciating the necessity of retaining both color and form under the repeated applications of heat, is very apt to adopt the higher-fusing bodies. This will become more and more the case as the price of a reliable pyrometer is brought to such a point that the average practitioner shall feel he can afford to own one.

Porcelain inlays should be grooved by the use of small diamond disks, and then, after imbedding the outer surface in beeswax, hydrofluoric acid should be used to remove the glaze from the portion that has been left exposed to its action.

Gold inlays are of great value as time- and labor-savers in posterior teeth with frail walls. But where the walls are strong and all parts of the cavity are reasonably accessible, a well-condensed gold filling will still be superior to each and all of its latest rivals. Given a properly shaped cavity and a well-made inlay, the lasting qualities of the entire work will depend entirely upon the cement used for the setting. Only a good hydraulic cement should be used, and preferably a quick-setter.

"A Microscopic Study of Cements," by Dr. Geo. C. Poundstone, of Chicago, read before the Illinois State Dental Society, May 10, 1904, appears in the *Dental Digest* for January 1905.* This article may have been overlooked

by many of our members, and I wish by this reference to bring it to their attention. The author endeavors to show that in the case of some cements the particles of the powder are so coarse that it would be impossible to bring the inlay into the close contact necessary for perfect work. In some cases, these particles seemed to fill about the same office that the broken stone does in the modern concrete construction—it acts largely as a binder. Gas or air bubbles are developed during the process of hardening, and seem to make the cement porous, thus inviting the ingress of the fluids of the mouth, causing disintegration. It was shown also that most of the cements tested continued to expand for at least twenty-four hours after mixing. This might account for some of the differences of apparent adaptation when seen several days after the original insertion.

The above article is interesting and valuable, as it presents another method for the investigation of the physical properties of cements.

Ascher's "artificial enamel" is one of the latest claimants for attention. The manufacturers state that it will make a permanent filling. It mixes with a sort of granular "feel," is a slow-setter, and must be protected from all moisture for at least twenty minutes after placing it in the cavity. It finishes off very nicely, resembling porcelain. A fellow dental practitioner was so enthusiastic after using it, that he said it would entirely supersede the porcelain inlay. Until we have a longer acquaintance with its properties and lasting qualities, I should advise against its use for setting inlays.

In the making of all inlays, where the cavity is approximal, full restoration of contour is difficult to attain; but it should be accomplished, as lack of such contour is a great injustice to the patient, and will often cause serious trouble owing to recession of the gums.

Before leaving the subject of inlays, I wish to bring to your attention some

*See also Dr. Poundstone's paper read at the Fourth International Dental Congress, at

St. Louis, Mo., August 31, 1904, entitled "The Cement Problem in Inlay Work," *Cosmos*, 1905, vol. xlvii, pp. 756-778.

small rubber wheels—Dr. Jenkins' porcelain-polishers. They should be mounted on a screw mandrel, and kept wet while in use. These little wheels will restore the gloss to a porcelain inlay after it has been ground for close surface approximation at the cavity edges. The manufacturers could improve these polishers by making them a trifle harder.

The advent of the inlay, as well as that of the latest produce of the cement manufacturer, brings up afresh the oft raised but never settled question of "fees."

In the May 1905 issue of the *Items* appears a paper by Dr. Robert H. M. Dawbarn, New York, on "Professional Fees and Fee Bills." The *Dentist's Magazine* for April 1906, quoting from the *Dental Brief*, gives an article by Dr. F. L. Fossume, entitled "High Standards and Financial Success." Both of these articles are worthy of a second perusal. While the question of fees is influenced very largely by local conditions, still there must be some basic principles governing the correct solution of the problem, and there can be no better time or place to attempt to discover them than at this state meeting.

As stated before, the inlay, because of the nice degree of skill and artistic taste required, together with the amount of time consumed, seems to call for an increase in the amount of the fee. And yet, on the other hand, as the durability of the inlay depends very largely upon the lasting qualities (non-solubility in the saliva) of the cement used for its fixation in the tooth-cavity—and, as we all know, the durability of any known make of cement is an unknown quantity—how much more should the patient be charged for the inlay in comparison with the charge that would be considered right and proper in the case of a reasonably difficult gold filling?

Likewise, in the case of some of the newer cements: They cost more at the very start than do many of the older cements; they take more care to manipulate, as well as time in the setting and finishing; and their manufacturers claim that they make permanent fillings. Shall the patient be charged proportionately

to the time consumed, or shall the question of lack of permanence be taken into consideration as an argument against the increased fee?

Should fees in all cases of similar work be made similar in amount, or should the punishment be made to fit the criminal?

A free discussion of some of the above points will prove of value to the younger members of the profession, saying nothing of the benefit that must of necessity accrue to many of the older members.

Such a discussion would confirm the wisdom of having a sort of "free lance" among your essayists.

Respectfully submitted,

E. HOWARD BABCOCK,
Committee on Practice.

Discussion.

Dr. M. L. RHEIN, New York city. I think the society has been fortunate in listening to the report by Dr. Babcock, which, so far as the subjects discussed are concerned, is more conservative than some of the other papers we have listened to during this session on this same subject. In the main I am thoroughly in accord with the sentiments of our committee on this matter, and I think that the profession at the present time is in danger to a very large extent by reason of the inlay craze—if I may call it such, for it has become a craze; and I do not care what fad there is that rises in professional practice, how great the method may be, or how much it may be needed, the tendency to run wild over it ought always to be more or less guarded against. We have listened during this meeting to papers—we have listened to one this morning—on inlays, that spoke of the disappearance of the gold filling, of their entire abandonment. I have read such remarks of practitioners for some years past in discussing this inlay question, and the tendency of remarks of this kind upon men who have been in practice for years has very little bad effect—it does not do any harm; but the tendency of such extreme remarks upon the young men just entering practice I consider

most damaging, most detrimental to their future interests; and I cannot conceive of any greater duty that presents itself to the older practitioners than to strongly condemn the tendency to go to extremes on this inlay question.

Now, if we stop to think for a moment, the porcelain inlay has only had a comparatively short time of trial in regard to its prominence—I mean the porcelain inlay in its present state of perfection; and the gold inlay in its present state of perfection has had a still shorter period of trial so far as permanence is concerned. For my part, I have seen failures of permanence in porcelain fillings that were beautiful when inserted, and this only strengthens me in the position I take. Not that this work is not the most approved method of operative dentistry in selected cases, and one that should be encouraged, but I disapprove of these extreme assertions that the gold plugger and the gold foil will disappear from our cabinet case, and that we will have no further use for them. And if this point of criticism be true of the porcelain inlay from the standpoint of clinical experience, it is much more so in regard to the gold inlay, for the gold inlay is much inferior to the porcelain inlay as a tooth-preserver. I do not speak of it from the point of strength in regard to standing stress under occlusion, but I do speak of it in its peculiar inadaptability in certain mouths. There is no question that the porcelain inlay well inserted seems to possess in a large number of mouths a peculiar property of preventing recurrence of caries around the margins. Now, we do not know definitely at the present time what this property consists of, but we know from very careful clinical experience that it is not present in all cases, just the same as we know that all mouths are not immune to recurrence of caries. Careful observation in the limited time since gold inlays have become popular has convinced me that the gold inlay does not possess this property in the same degree, and there are many various theories why this should be so. The character of the ce-

ment that is used in such inlays, and its combination with the metal of the baser metals that form the alloy used for soldering, point to the possibility of an electrical action around the gold inlays, a point which I wish to draw out for your consideration.

This is not intended to belittle the value of the gold inlay; I use gold inlays almost every day, but I believe there is a place in operative dentistry for porcelain inlays, for gold inlays, and for gold fillings. I want to make clear just one point that I consider valuable for gold inlays. The gold inlay is especially valuable in such distal, or for that matter mesial, approximal, and occlusal cavities, in the posterior portion of the mouth where the teeth have lost their absolutely perpendicular position, and there is such a slant to the tooth that it makes the insertion of a gold filling a very difficult operation—I do not propose to say an impossible operation, for I have never seen a case that could not be properly filled with a gold filling, but it makes the insertion of a perfect gold filling so difficult that it is a dangerous expedient. In these places the gold inlay answers a most admirable purpose, and is certainly to be favored, but when it comes to cavities that are readily accessible to any good operator—who ought to be able to place a perfectly inserted solid gold filling in the time that a gold inlay can be made and inserted—the gold filling is preferable. And what is the comparative difference? A gold filling properly inserted in such a cavity, with a lining of cement to protect the dentin and of gold in covering the enamel margins, is infinitely more perfect. The gold protects those margins much better than a cement margin, that is bound to be more or less defective as time goes on, and it is subject to those chemical actions of the fluids of the mouth that we are investigating at the present day. And I therefore say to the young men who are starting in dentistry, Beware of any advice that would foster in your minds any idea not to perfect yourself in the methods of inserting a perfect gold fill-

ing. In this I am simply seconding the admirable advice that Dr. Babcock lays down in his report.

Personally, in the use of porcelain inlays I differ with the author in regard to the form of porcelain that he uses. Originally, I for years preferred the high-fusing porcelain for inlays. The principle of inserting the porcelain inlay and the gold inlay should be to restore the missing portion of the tooth just as perfectly as we have been able to do it with gold. I have read only recently of some well-known writer having stated that we cannot always restore the contour properly, and I claim that if the inlay is inserted without the proper contour—if it does not fully restore the proper contact point, it is more defective than an imperfect filling would be in the same place, and I also claim that there is no excuse for the use of the inlay unless that contour is perfectly restored. For the restoration of that contour I believe that the low-fusing bodies are infinitely superior, for the reason that it is almost impossible to restore the missing tooth-structure with absolute accuracy with high-fusing body; whereas the low-fusing bodies can be polished and finished to proper shape in the same way as an ordinary gold filling.

I also differ with the essayist as to the value of the pyrometer. The pyrometer is indispensable in the correct baking of the porcelain filling. We have reached the stage in porcelain work where there is no valid excuse for any man to attempt porcelain work and depend upon his eye for the possible correct fusing of his porcelain, because with the pyrometer there is a certainty of results in the baking of the porcelain that it is impossible to reach otherwise; for if the porcelain be overbaked you have a material that is more or less worthless, and if it be underbaked we have the same result.

I agree with the essayist's remarks on cements in general. I believe that the coarse granular cement should never be used for setting an inlay of any character. The thinner the mesh of the cement the more positive are we that there will be less danger from the expansion of that

cement during the hardening process; and if a cement cannot be obtained that absolutely matches the shade of the porcelain, then the dead white cement is the color to be used. No attempt should be made to use a dark cement because we have a dark inlay, for if we cannot match that inlay, the dead white cement is the one that will interfere with the color scheme less than any other we can use.

One other point brought out by the essayist I would like to speak of, and that is the question of fees. As a rule, I believe that the dentists today in the city of New York are very much underpaid in all their fees. As residents of large cities we certainly realize the advance in the cost of living expenses in general from what they were when I entered the practice of dentistry, twenty-five years ago. I believe it costs in the city of New York twice as much to live today as it did at that time, and I have no doubt that in the interior the same increase in expenses meets the practitioner. Have the rates of dental service increased in proportion? From my observations around the larger cities, and from my talks with the older practitioners, I do not believe they have, and that is the basis for the statement that I make that I believe that dentists as a rule are underpaid. Now, we cannot adopt any method of graduating prices for operations or professional services; that will always be impossible. The value of each man's professional services rests right between what he believes it to be worth and what his patients are willing to pay for it. The only reason I have for referring to this part of the report of the Committee on Practice is that I believe the older men, the men who have been in practice for years, who have well-established practices, practices in which they can get the fees that they ask for, are remiss to themselves; they are remiss to their families when they continue to charge fees on the basis they charged years ago. I believe the successful older men should charge higher fees. I believe they are entitled to them, and it would make it much easier for the younger men if they followed that course.

Dr. W. S. ROSE, Schenectady. I want to commend the report of the Committee on Practice, as I think it is well prepared and well submitted. It is certainly a case of *multum in parvo*, and I think the doctrines therein promulgated are generally correct. There are some things in the report that I think it would be profitable to discuss if we had sufficient time.

The essayist's reference to porcelain inlays is somewhat conflicting. The old question of high- and low-fusing bodies is once more revived, and the committee makes the statement that the low-fusing seems to be better adapted for beginners, but in proportion as a man becomes expert he will resort to the high-fusing bodies. In addition to that he speaks of the perplexing question of whether gold or platinum should be used in the making of inlays. If the question be as to whether gold or platinum is to be used, then I think the perplexing question is still the choice between the high- and low-fusing bodies. The essayist prefers platinum because it does not require investing, and saves time. This means that he is a disciple of the low-fusing bodies, otherwise gold would not be excluded from choice, but from necessity. I surmise, however, that the dental supply houses would report much larger sales of the low-fusing bodies.

Dr. BLACK, from his statement concerning the porcelain inlay—if I could read between the lines yesterday—is under the impression that porcelain inlays at no distant date will not be so much in demand as they are at the present time. I should like to hear him commit himself a little more definitely in that line. I should like to hear more concerning the Ascher artificial enamel. And right in this connection might be considered the complex question of fees; whether the man who uses artificial enamel should charge the same as the man who makes a porcelain filling or a gold filling; that is, whether the material should enter into the question of fees.

I think, however, that the question of inlays is not the leading question before the profession today. I think there are other questions, and some were touched

on by the president in his address, that are more interesting and important than the question of porcelain inlays. I think the question of specialization in dentistry should occupy our attention; not that it will affect it so much today, but because the future of dentistry is controlled by those who are practicing now. If we encourage specialization in dentistry, we shall doubtless, by so doing, render our patients better service.

I think also there is another question that is very important to us, and that is the question of advertising the prices of dental work, the commercializing of dentistry. I do not refer to people shopping around among dentists to ascertain prices for comparison. This is a minor result, and bad; but the public get the idea from dental advertisements that a bridge is required here, a crown or an inlay there, and instead of coming to us for professional services, come with a commercial order for what they, rather than we, decide they need. The proper order is reversed; they become the judges, and we become the recipients of directions—an inferior position. I think that dentistry will occupy a lower position than it warrants among the professions until we overcome this difficulty. I saw a clipping from a paper not long ago in which were the advertisements of two dentists, and under these a half-dozen cards of lawyers. While the dental advertisements did not contain prices for work, they referred to the operators' qualifications and modern equipments. But the lawyers' cards simply gave their places of business. I have been told that in the legal profession they would not tolerate a thing like that. And it seems to me that it would be profitable if our society were to spend several sessions in carefully discussing ways and means of preventing it. If we could prevent it, our profession would immediately rise in the estimation of the public, and we would have no difficulty in obtaining fees proportionate to our services.

Dr. BABCOCK (closing the discussion). In giving such a report as this it is only natural that individual ideas and opinions should predominate, especially when

the report must be presented in brief form in order to canvass the whole territory. I feel toward all these new methods and improvements that we should welcome them. I do not consider that any one of them should run away with us, and for that reason I was conservative. I appreciate the criticism of Dr. Rhein, and also the remarks of Dr. Rose. Of course, in the question of using gold or platinum it is a matter of using the low- or high-fusing bodies. I simply advanced the idea that the man who used gold for the matrix would be compelled to make investments, and that I consider a waste of time. There are arguments in favor of both forms of porcelain, and I simply wanted to impress the idea that we should take a middle ground on such questions. These questions of methods and improvements, when first introduced, are very much like the starting of the pendulum of a clock; at first it swings off in one direction, and then back in the other, until it finally strikes a happy medium. And in closing my remarks I would make use of that familiar quotation from Pope:

In words, as fashions, the same rule will hold,
Alike fantastic if too new or old:
Be not the first by whom the new are tried,
Nor yet the last to lay the old aside.

CLINICS.

Dr. W. A. BURNS, St. Thomas, Canada.
"Quick Method of Repairing Porcelain Facings in the Mouth."

The following is a description of the technique of Dr. Burns' method: (1) Remove the remains of the old facings and pins. (2) Select a suitable facing, cut pinholes in the backing, and grind the facing to fit the backing accurately. (3) Remove the facing, take a thin strip of platinum, and bend it around the pins to form a tube by means of a pair of flat pliers. (4) Cut off the pins close to the tooth, adjust the platinum tubes, and solder each tube either by means of the blowpipe after investing the piece, or in a porcelain furnace, using the smallest possible quantity of solder. (5) Slightly enlarge and countersink the holes in the

backing; readjust the facing; hold it in position and burnish out the tube to fill the countersunk holes with a round burnisher. Then fill the opening with either gold or amalgam. The chief advantage of this method is in the ease with which facings are replaced in almost inaccessible places in the mouth, and in that it permits of the use of saddle-back teeth so suitable for obtaining artistic effects.

Dr. H. H. TOMPKINS, Utica. "Practical Novelties in Porcelain."

This clinic consisted of a demonstration of some of the changes that can be made by the operator himself in porcelain crowns and facings as they come from the manufacturer, and adapting them to special cases.

Each sample that was shown was accompanied by the original duplicate tooth so that the various changes could be easily contrasted.

(1) The clinician showed an S. S. White detachable crown in which the gum lap had been considerably extended. It was intended to meet the requirements of cases in which the gum is deeply festooned and in which the root of the tooth to be crowned cannot be covered by the artificial crown as regularly made.

(2) A Johnson & Lund diatoric tooth for bridge work; the body was extended to fill a space that was too broad for one tooth and not broad enough for two. The entire external surface of the tooth was removed and reproduced in deeper shades of the same colors.

(3) A Consolidated tooth from which the entire external surface had been ground off and reproduced, changing the crown portion from a light straw color to a deep blue, and the neck of the tooth to a color imitating that of tobacco stain.

(4) Gum effect produced on Brewster replaceable dummy tooth.

(5) That of a facing to which porcelain had been added, and which in cooling had checked badly between the pins, demonstrating the advisability of grinding out the pins when a facing is to be employed in building up an all-porcelain crown.

(6) A portion of gum enamel had

been cut from a gum section for vulcanite and spliced on to the neck of a detachable crown. It was intended to be used as a dummy on a bridge where the natural tooth had been lost from extensive recession of the gums. The colors were so harmoniously blended, and the porcelain so nicely laid on and fused, that it was practically impossible to detect the point of union on any of the samples.

Dr. F. R. WATSON, Georgetown, Canada. "Filling Lower Cervical Cavities with Gold Without Rubber Dam."

Much pain to the patient and trouble to the operator may be avoided and time saved, by laying aside the rubber dam and following this simple method with many of these cavities, and especially with the more sensitive of them. The chair should be at an angle of forty-five degrees, or nearly so. Saturate a small pledget of cotton with adrenalin chlorid solution, and apply it to the gum in the region of the cavity, pressing the gum margin down firmly if necessary. The cavity may be prepared before or after applying the adrenalin chlorid solution according to its position or sensitiveness. Now pack the cavity with cotton, and prepare the gold (softer forms preferable) and finishing instruments. Reapply the adrenalin solution to the gums, leaving the saturated pledget under the gums if necessary, and apply cotton rolls to the labial and lingual surfaces. Dry the cavity with warm air and proceed with the filling. There will be ample time to fill and polish perfectly. If the flow of saliva is copious, atropin sulfate may be administered to the patient an hour previous to the operation.

Dr. W. S. ROSE, Schenectady. "Reinforced Porcelain-face Shell Crown."

Construct a two-piece shell crown of 23-karat gold, using any good flux to fuse the parts together. As no solder is employed, this gives practically a seamless shell. Reinforce the cusps of the shell, or of an Evans crown, with pieces of 22-karat plate. Saw out the face, leaving a point of attachment near the cervix. Depress this piece for a backing, and

bake a facing of Jenkins porcelain. The prosthetic body may be used if desired.

Dr. W. C. TROTTER, Toronto, Canada. "An Easy and Inexpensive Method of Making an Accurately Fitting Metal Plate, Showing Very Little Vulcanite."

From a plaster or modeling composition impression of the mouth, make a metal die by pouring with low-fusing alloy (Olivian preferred). On this die quickly swage up a thin piece of gold or aluminum in the Olivian swager, leaving the margins of the plate extended sufficiently beyond the plate line to enable one to fit in a piece of wire around this line, and fold the margin of the metal over it in such a way as to leave jagged attachments here and there for the vulcanite. This gives a beautifully finished margin to the plate, and at the same time provides a ready and strong attachment for the vulcanite, either with gold or aluminum. Now set up the teeth with wax in the ordinary way, and invest the plate in the lower half of the flask. Carefully remove the teeth from the wax so as not to disturb the holes in which they are seated, and then with a ball of soft plaster take an impression of the buccal surface of the plate, including the inside or lingual margins of the wax. Around this plaster impression tightly wrap a piece of stiff paper, and pour the fusible metal; place in the swager and strike up another piece of thin gold or aluminum which will accurately cover the whole buccal concavity of the plate, fitting in so closely under the projecting lingual edges of the teeth as to show absolutely no vulcanite whatsoever, and also so as to hold it firmly in its place. This palatal piece of metal is now stuck down closely to the metal plate with an almost invisible layer of wax, the teeth are set back in their places, and the case is vulcanized and completed as in the usual way.

I claim for this plate considerable strength, cleanliness, smooth and closely fitting comfortable margins, and great accuracy and closeness of fit in general, owing to the extreme ease with which this thin metal can be driven into the smallest

depression or undercut. The combined thickness of the two layers is not greater than that of the ordinary heavy aluminum or gold plates used in making metal plates. The thin metal is relatively cheap, even using the double layer, as the buccal layer is usually comparatively small.

Dr. G. A. ENGLERT, Catskill. "Anesthetization of the Dental Pulp in the Presence of Pulp-Nodules and Other Obstinate Conditions."

As a rule the most extreme tenderness of the dental pulp is at or nearest the point of the lesion. Having attempted once or twice first to fully open, and secondly to anesthetize the pulp at the point of the lesion, but having failed, I then approached the pulp from another flank, *i.e.* drilling through the enamel and dentin with a double-bevel sharpened No. 1 rose bur. This procedure is less painful than would at first be supposed. Having reached the pulp at such a point, the medicinal preparation is readily absorbed, and the pressure that may be exerted is less painful. One slight application of pressure is often sufficient to enable one to return to the original cavity, which only a moment ago was almost too painful to approach, and to open it painlessly. The medicinal preparation I use is pure cocain hydrochlorid, crushed and made into a paste by the addition of oil of cloves. This is applied on the pulp, and is followed with cotton saturated with extract of Indian hemp, and the whole is placed under a compress of black unvulcanized rubber. The congestion of the pulp being relieved, I carry up the root, if found necessary, a very mild solution of cocain, say of one to two per cent. strength.

In this manner you can often obtain relief in stubborn cases of pulpitis, where it is next to impossible to approach the point of the lesion, there being so much debris lying over the pulp as to make any application at that point ineffective. Tapping a tooth can often be resorted to in hyperemia of the pulp, as well as for pericementitis when induced by a gangrenous pulp.

Dr. W. B. FAHNESTOCK, Cincinnati, Ohio. "A Simple Method of Making Gum Sections with Prosthetic Porcelain for Partial Dentures and Removable Bridges."

Not infrequently we find it preferable to use porcelain gum sections in partial cases where one or more of the natural incisors have been extracted, and where considerable resorption of the alveolus has resulted. Restoration of the facial contour with a harmonious arrangement of the teeth is quite impossible in the majority of cases when stock gum sections are used, owing to their stereotyped regularity, the disproportionate sizes of the laterals, and the absence of natural tooth-contour which characterizes almost without exception this product of the tooth-manufacturer.

It is a lamentable fact that artificial teeth as a whole tend to the conventional rather than to the natural forms, to such an exaggerated degree that it is almost impossible to produce either a partial or a full artificial denture which is not noticeable as such. In the face of these difficulties we are called upon to supply artificial dentures which will not only replace the lost organs of mastication in a practical manner, but we must restore also the natural facial expression so far as the dental organs are concerned. To accomplish this successfully calls for the production of natural effects through the selection and ingenious combination of those materials at hand which will produce the most harmonious results. There is probably no class of cases which calls for greater display of art than those where several or all of the incisors have been extracted, the alveolus has receded, and the sunken lip, when retracted in laughing or speaking, is raised to or a little above the gum line. Pre-existing irregularities of the natural teeth and present dependent irregularities in the occluding teeth, when considered in relation to facial expression, call for—in the artificial teeth—a facsimile of characteristic type and arrangement of the natural teeth. Plain teeth of the proper type or mold, with porcelain and gum enamel to supply the lost alveolus and

gum tissue, will supply the peculiar needs of such cases better than will other combinations of teeth and gum substitutes; hence I will endeavor to explain a simple and practical method for making gum sections for such cases.

For example, let us suppose that the upper left central, the upper right central, and the lateral incisors have been removed. The remaining teeth show that the V-shaped arrangement, with the lateral and central lapping from the right toward the left, is characteristic. The gum is exposed when the lip is normally retracted. Obtain a hard cast, and obliterate all imperfections, so that the cast will convey the expression which you desire to bring out in the subsequent arrangement of the artificial teeth. Outline upon the cast the area to be covered by the artificial gum, and deepen this area by scraping lightly and uniformly throughout. Make the border of this deepened area defined—as though the finished block had been slightly pressed into the cast. Burnish thin platinum upon this area, and allow it to hook over the ridge for an eighth of an inch—extending it close to the teeth on either side—and trim accurately to shape. Shape the platinum so that it will lie closely upon the cast, as would be done in placing tin foil upon a cast for a vulcanite denture. Select vulcanite teeth which will most nearly approach the desired arrangement, and then if necessary—and it will be necessary—modify their form and give them character by judicious shaping with a fine abrasive wheel; polish them perfectly in the usual way before they are finally fixed in the wax upon the cast. Now place the platinum saddle upon the cast and arrange thereon the teeth, using only sufficient wax to engage the pins and extend up behind, but not over the necks of the teeth. The extreme edges of the teeth at the necks must not be covered with wax, nor must any more of the platinum saddle be covered than is necessary for securely holding the teeth in the desired position during the process of arrangement.

When the teeth are waxed in place, lift them together with the platinum saddle

from the cast; then varnish and oil the cast for about one-half an inch beyond the area covered by the platinum—on the labial surface only. Replace the teeth and saddle, being sure that they are in the exact place upon the cast, and invest their labial surfaces in plaster—including also the labial part of the saddle and the varnished area of the cast—in such a manner that when the investment has hardened, it, together with the teeth and saddle, can be readily removed from or replaced upon the cast as may be required. Next remove the investment with the teeth, etc., and boil out the wax. The platinum saddle will separate during this procedure. When all is perfectly free from wax, replace the teeth in the original position upon the cast, and hold them there with the forefinger, when the saddle, teeth, and investment will be upon the cast in the same relative positions which they occupied before they were removed; but the wax having been removed, a space will be found behind the teeth. This space, extending around the pins, must be filled with prosthetic porcelain body. This can be facilitated by repeated applications of the dry powder, followed by flooding with clear water, then jolting and teasing the wet mass into the minutest spaces. Be sure, however, that the porcelain is not allowed to remain about the pins of the teeth, and not to fill more than the interdental spaces and the space between the ridge-lap of the teeth and the platinum saddle. With a clean cloth absorb the water from time to time during the application of the porcelain, and when the space has been solidly filled remove the investment as before with the teeth and saddle, and without disturbing the saddle, which will stick to the investment by means of the fresh porcelain. Embed the reverse side in an investment made of Peck's inlay investing compound. This second investment should engage the pins of the teeth, and all other parts. In other words, the saddle and teeth should be sandwiched between the two investments, neither of which must engage the other.

After the second investment has hardened thoroughly, cut off the first invest-

ment of plaster after the method employed in removing a plaster impression from a cast. With the plaster investment removed, the case, supported by the second investment, should present the same appearance as when waxed up on the cast, excepting that porcelain body will now be seen in place of the wax. The teeth and saddle, held securely by the second investment of compound, are now ready for the application of the porcelain body which is to restore the deficiency in the alveolus and gum tissue. Add sufficient porcelain to give the required fullness, and carve it to the closest possible imitation of nature. Exercise great care that the porcelain is packed solidly, and that the material which is placed upon the labial side shall be made to unite with that which was previously placed behind the teeth from the palatal or the lingual side. This being completed, insert the case into a cold muffle of the inlay furnace, and raise the temperature gradually to a red heat. This will be sufficient to shrink and biscuit the porcelain. After cooling, the cracks caused by shrinkage must be filled with porcelain paste, and if these cracks are not large, the gum enamel may be spread upon the case and all fused to a glaze in the second firing. If, however, there are wide cracks after the first biscuit, it may be well to fill and obliterate these cracks during successive firings, before spreading on the gum enamel. After the final glaze the investment is to be removed, all feather edges ground off, the section again placed upon the cast, and the process of mounting upon a vulcanite base completed.

Gum sections made in this manner may be mounted upon vulcanite or metal saddles, and attached to the several forms of bridge abutments, after the various methods of removable-bridge construction.

The features of this method are that the thinness of the platinum used enables one to conform it to the plaster cast without the necessity of swaging it between metal dies, while the saddle and teeth are held securely without solder during the application and fusing of the porcelain.

Dr. I. J. COE, Baldwinsville. "The Use of Cement Under Gold and Amalgam Fillings."

Although soft cement has been used under amalgam for years, my experience for at least three years goes to show that we would do well to give this valuable combination a much wider range of application. I have been using more and more extensively soft cement under both gold and amalgam, and I believe the results warrant its more extended use. The benefits noted are—

(1) *Protection.* Sensitive dentin will tolerate a filling of this kind in many cases where an all-metal filling would cause undue irritation, and probably, in time, the death of the pulp. Still greater protection may be gained by first applying a disk of gutta-percha, the under surface of which has been coated with a good cavity varnish. It affords also greater mechanical protection to the enamel walls. In many cases the cement alone is sufficient to retain the filling, thus obviating the necessity of drilling undercuts which weaken the walls. Caries will progress much more slowly under a filling lined with cement, because of the perfect adaptation of the filling to the cavity walls. In filling a large cavity with gold, we may direct the blows more squarely against the floor of the cavity, thus enabling us to fill some teeth which would ordinarily prove too weak and brittle to be filled with gold. In this way, we may in many cases mechanically protect the tooth with the filling, where it would be necessary to protect the filling with the walls of the tooth if no cement were used.

(2) *Retention.* The cement alone is sufficient to retain fillings in all simple cavities, but in compound cavities including the occlusal or incisal angles, there should be secured ample retention in the usual way, being careful to allow no cement to fill the undercuts or dovetailed spaces. In many compound fillings not subject to the stress of mastication, the cement alone is sufficient.

(3) *Color.* Cement under a metal filling will greatly improve the color of transparent teeth, and we may thereby.

conserve certain portions of labial or buccal enamel walls.

(4) *Separation of teeth.* No previous, and very little immediate separation is necessary. There is no packing of gold into undercuts which are difficult to approach, and consequently one may give his undivided attention to condensation, margins, and surfaces. Very small approximal cavities, especially those approached from the lingual aspect, are much more easily and quickly filled by this method. The cement anchors the first piece of gold, so that the work may be easily accomplished with one hand, leaving the left hand free to hold the mirror.

(5) *Pain reduced.* With simple cavities especially, the decayed dentin may be lifted off with very sharp spoon excavators, causing almost no pain, even in hypersensitive teeth. Then the margins are trimmed, and the cavity is ready for the filling.

The method of procedure is as follows: Apply a thin film of cement to the whole surface of the cavity with a flat amalgam instrument of suitable size and shape. Then quickly wiping the instrument, apply with the same instrument one layer of gold, and press it firmly into the cement. After a little experience one can do this so that very little excess cement

will be squeezed out at the margins. The gold which I prefer for this work is the strip form of Watt's crystal gold, and the cement I use is Ames' special inlay cement. This cement will set in two minutes, giving just about time to thoroughly remove the cement from the margins. To avoid the powdering of the cement, be sure that it has set before condensing the gold upon it. We have now a large flat surface to work upon, and the filling is quickly and easily completed. This gold, if properly condensed with suitable pluggers, will have a smooth and more durable surface.

Any good sticky cement will do for the amalgam fillings. Apply the cement in the same manner as outlined above, and press a flat piece of amalgam squarely into the latter. Now, with a ball burnisher, wipe the amalgam against the floor and walls of the cavity, beginning at the cervix and forcing the excess cement out at the occlusal, or most accessible portion of the cavity. If the margins are easily reached by the instruments, the forcing of the amalgam into place will free the margins from cement, and there will be no appreciable amount of cement left in the cavity. It is preferable to use the gutta-percha and varnish in all cases where we desire the greatest protection from thermal changes.

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, Bridgeport, Conn., April 18 and 19, 1906.

(Continued from vol. xlviii, page 1227.)

WEDNESDAY—Morning Session.

(Continued.)

Dr. Nyman's paper was then passed, and the President announced as the next order of business the reading of a paper by Dr. V. H. JACKSON, New York, N. Y., on "Orthodontia."

[For synopsis of this paper, see "A Practical Talk on Orthodontia," published in December issue of COSMOS, vol. xlviii, p. 1233.]

Discussion.

Dr. GEORGE T. BAKER, Boston, Mass. I do not think that I can discuss Dr. Jackson's paper, but I can corroborate what he has said. The testimony of a witness in court is sometimes strengthened when it is corroborated. Now, if I can say anything which will induce you to follow his teachings, I will willingly do so. He has been a great help to me, and I believe that in this work we can accomplish results with Dr. Jackson's system very much more rapidly and easily than with any other system in a great many cases. I am not wedded to any one particular treatment in operative or prosthetic dentistry, but have always held that different cases require different treatment, and I believe this same rule holds true in orthodontia. There are cases when perhaps one system is more applicable than another, and there are very many cases in which Dr. Jackson's system is the best. That has been my experience.

I heard it said in Buffalo last summer, in discussion before the National Dental Association meeting, that there was no such thing as a Jackson system. Now, I thoroughly believe there is a Jackson

system. Dr. Jackson has worked out this method—which it has taken him years to do—and when he stands on the platform and explains a thing to us which is apparently very simple, we do not perhaps realize that it is the result of many failures and years of experience on his part; but it is true. Today, in the East, there are but two systems of orthodontia in general use. There is the Angle system—so called—and there is the Jackson system. The Angle system means the use of the expansion arch and clamp bands attached to the teeth by means of screws and nuts. The expansion arch gets its power from the nuts resting in front of the tubes of the clamp bands, as well as from the spring in the arch wire itself, and the power is carried to the teeth by means of wire ligatures. In the Jackson system the ligature is done away with altogether, as it is never used, but the force is obtained wholly by the spring of the metal in direct contact with the tooth, and the spring force is the simplest we can apply to the teeth. It is direct and positive, very efficient and completely under control; and that is a great thing in its favor. Dr. Jackson has not only given us a thorough exposition of the mechanical features, but in his work he has given us an excellent classification of the etiology of all these cases, and really that is the principal thing. The mechanical feature is nothing in comparison with the etiology, for if we really know what causes an irregularity, we are in a fair way to correct it. We may take a case in point in medicine; for instance, in tuberculosis, the cause has only been recently understood, and tuberculosis is now looked upon as a disease of malnutrition, and it is often cured by attention to hygiene and dietet-

ics solely, and without the exhibition of drugs. The minute we get at the real cause of any trouble, we can remedy it, and if we study the etiology of irregularities, then we are in position to practice orthodontia successfully. Dr. Jackson has given us an excellent exposition of this feature of the subject, and it is going to be understood more and more all the time, as is beautifully shown in his treatment of the cases exhibited in the charts.

Just one other point, and that is in starting out in this work. The best way to begin is to try a simple case. If we start with a complicated case we will have a failure, and failures are very discouraging, and may cause one to give up this work altogether. If, however, we start on a simple case—for instance a case of an inlocked incisor, which is one of the simplest operations—we will probably succeed, and then we may feel like attempting a more complicated case. And so if we start gradually with Dr. Jackson's system, I believe we will have success.

Dr. ROLOF B. STANLEY, New York. I feel in discussing the merits and demerits of orthodontia appliances that differences of opinion with regard to their value are based upon our conception of what the ultimate result should be. The ultimate result covers the whole field of orthodontia, and so a discussion of what is shown here would be entirely out of the question. There are just a few things that I would like to speak of, however.

From the diagrams I would feel almost inclined to adopt Dr. Jackson's method of correcting malocclusion, were it not for the fact that I am called upon to treat the cases which come to me for greater complications than his diagrams show.

In a large majority of the cases that I have treated, expansion of the arch was called for. Furthermore, I find that the bicuspids, laterals, and centrals nearly always need rotation, and the work must be carried on together with the expansion of the arch. Dr. Jackson said that the arches are usually broad enough in the region of the molars. I do not find

such to be the case; in fact there are very few cases which do not require expansion in the molar region.

When he speaks of the cases characteristic of mouth-breathing, or the reverse condition, lower prognathism, in every instance expansion of the molar region is necessary, not only in one arch, but nearly always in both.

Now with regard to the age of the patients: I think Dr. Jackson is entirely right in commencing as soon as any trouble is in evidence. I have many patients with the same trouble that Dr. Jackson referred to, who are very young.

As to the frequency of appointments. I see my patients two or three times a week. I prefer to do that, as I would be afraid to allow them to go three or four weeks. I do not think that it is the fault of the appliance I am using, but simply because I want to follow the changes all the way through. I want to know that all the teeth are moving on the exact line that I have outlined for them.

Allusion was made to the application of wire ligatures as seen in a clinic at one of our universities, in which the patient underwent terrible torture. I think many of these patients probably would have undergone torture in any operation undertaken in the dental clinic under such conditions. Now, I think I can apply the ligatures in such a manner that they will not make the patient squirm out of the chair. I put them on patients of all ages, and try to insert them painlessly, and think I succeed. I do not find them going into fits or trying to squirm out of the chair. It is the same with this operation as with any other. there are two ways of doing it.

With reference to the equalizing bands, as Dr. Jackson calls them, in the case in which he retracted the teeth, I cannot conceive how, as he describes the application, it can do anything else than draw the lower teeth forward more than it will retract the upper. By the use of the anchor band attached to the molars and holding the arch firmly, ligated to all the teeth, the incisors included, you can produce the forward or backward

movement of the teeth in the opposite arch. If you hold the teeth in position by ligating them to the lower arch, they will hold exactly where you want them, and all the force of the elastics will be applied to the upper teeth.

With regard to the extraction of teeth, I know that Dr. Jackson deprecates such a procedure. He says in some cases it is justified, as in protrusion. I have seen a good many cases of protrusion of the upper teeth, and have seen a great many treated by their extraction, but have not seen one instance where it was justified. By the use of the intermaxillary elastics you can retract or reduce the protrusion of the upper or lower teeth without moving the molars back a fraction of an inch. That is, by expansion alone, sufficient room can be obtained to admit of retruding the anterior teeth as much as though the bicuspid had been removed. Now, I have never, in all the cases I have treated—and I know of many others treated in the same way—felt in one instance that the operator would be justified in the extraction of the bicuspid.

Mention was made of the Angle system. I suppose that simply refers to the Angle appliances. We of the Angle school dislike to hear that term used, and when one speaks of the Angle system we attempt to correct it, and try to make the person look at it in a different light. It is a wrong conception, this viewing of orthodontia merely as a study of appliances. The principle of the Angle expansion arch is not new; it is simply modified and reduced to more convenient proportions. The Angle school represents something more than mere appliances.

With regard to starting on simple cases, as alluded to by Dr. Baker, I think any case in orthodontia requires a great deal of thought and study. Take a case that is apparently very simple, which looks as if you have only a few teeth out of position in the upper arch; when you come to study it you find a great deal more than that. The mesio-distal relation of the upper and lower buccal teeth may be correct, and therefore you might

say should not be disturbed; but in the front of the mouth, if we study it from a scientific standpoint, we might find that the condition in that region, which at first seemed so simple to treat, involved the movement of all the teeth in both arches. So I think any case means that we must study it very carefully and thoroughly, especially in young children. We must consider the type presented, and the age at which the deformity began. In some instances we are justified in leaving a result, or obtaining a result, which might be termed double protrusion, because we know that later in life, as the child grows, the face will grow into and eventually balance the prominence in the region of the mouth.

I think that the system of cribs, suggested by Dr. Jackson, is a very cleanly system, and if it would meet all requirements, it would be ideal; but in my hands, and in many others, it would fall far short of accomplishing all that I deem necessary to accomplish.

Dr. E. S. GAYLORD, New Haven. I am not in any sense an orthodontist, nor have I in any degree practiced orthodontia, but I early recognized the necessity of placing the teeth in proper position and relation to each other in the jaws. I commenced years ago sending my patients to Dr. Kingsley of New York with good results, and continued to do so until he told me that he could no longer accept my patients, having a practice that was outgrowing him to the extent that he did not feel justified in taking patients from out of the city. I then sent my patients to Dr. Farrar, with the same good results, and continued sending them to him until he told me that from increasing years and practice he was unable longer to accept my patients. I then fell back on Dr. Jackson, and he has already intimated to me that my patients are becoming a burden to him; but I want to make the statement now that I am not going to accept a turn-down from him. So that what I have to say on this subject is from the standpoint of an interested spectator, and the satisfaction I have derived in the expressions of pleasure and gratification of my

patients for the past fifteen years relative to the results of the operations by Dr. Jackson. The satisfaction I have had from hearing the testimony of these patients, both young and old, is abundant compensation to me for having been instrumental in placing them in Dr. Jackson's hands. During all these years that I have been sending patients to him—I cannot enumerate them, but there have been many, and I think today Dr. Jackson has nine or ten of my patients under treatment—I have not heard a criticism upon the part of any patient as to the result obtained; it has always been absolutely satisfactory.

Dr. JACKSON (closing the discussion). I am pleased with the discussion of the paper, and with the way the gentlemen look upon my method.

In regard to the rotation of teeth at the same time they are being moved to position, we generally begin the rotation immediately; that is, we apply the necessary force to bring the tooth into correct alignment and rotate it at the same time.

This is usually done by cementing to the tooth a collar with a lug soldered on the lingual side. The lug is usually made of a short piece of plate metal, as wide or wider than the width of the tooth, and bent at an acute angle before soldering. Force is applied with a spring made to rest on the flat surface of the lug below the flange at the mesial or distal end, according to the direction the tooth is to be rotated. Force applied at the end of a lug in this manner acts as a lever for causing its rotation as it is being moved into line.

In some cases, however, as where an adjoining tooth is beginning to erupt, or where we want to include the tooth in the anchorage for moving others, we would not rotate the tooth until later, and would arrange the appliance accordingly. With my system it is different from the use of the expansion bar in obtaining anchorage. For instance, if we want to move the bicuspid outward and keep the molars firmly in position, it is sometimes difficult to get sufficient anchorage with the expansion bar, as there is danger of forcing the molars inward

while the bicuspid is being forced outward; but with my system we have the advantage of being able to use any number of teeth required for anchorage, even using some that are to be moved later, and we can determine beforehand how to construct an appliance so as not to interfere with an erupting tooth.

Dr. Stanley spoke of regulating teeth for little patients. I would like to ask how he regulates teeth for children with the system he practices, where the teeth are just erupting. When, for instance, a lateral incisor is erupting improperly in the arch, does he apply force to correct this immediately; or does he wait until the tooth is erupted sufficiently to attach to it a ligature, collar, or a clamp-band. There is an advantage in moving these teeth while erupting, as they can then be moved more easily. The process gets harder and firmer after the tooth is erupted, and more force is required for the movement. With my system we gain anchorage by spring-clasp attachments over the deciduous molars, and extend a small wire spring to guide the tooth to a correct position.

Dr. Stanley, in speaking of my system, used the term "crib." Crib does not apply to my present system. The crib method that I devised was the passing of a wire around the teeth of the arch, resting on the labial and lingual sides near the gum for anchorage. The wire on the labial and lingual sides was connected by short pieces of wire passing over the arch at the junction of the teeth, and united with solder. In some cases the ends of the main wire were left free to form springs for moving individual teeth. In other cases, for this purpose short springs were soldered to the wire on the labial or the lingual side. The system that I am describing today is entirely different. I term it the Jackson, or the "arm and finger system."

The doctor says that he sees his patients three or four times a week. I usually see my patients but once a week, and frequently have cases where six weeks intervene between visits. The appliances being removable, permit of thorough cleansing of the teeth and appliance.

The paper was passed, and the President announced as the next order of business the reading of the report of the Committee on Necrology. In the absence of the chairman, Dr. L. C. Taylor, the report was read by Dr. E. S. GAYLORD, as follows:

COMMITTEE ON NECROLOGY.

During the year passed Dr. George E. Nettleton of New Haven has been called from earthly scenes into that higher life which knows no ending. We record his departure as the loss of one who for many years has been a consistent member of this association. For more than thirty years he had been an earnest co-worker, honored and trusted by a large *clientèle*. His positive yet affable nature won for him more than usual the respect and confidence of all who knew him. He was also a warm friend and helper of many young men entering our profession.

The following resolutions are submitted:

DR. GEORGE E. NETTLETON.

Whereas, By the death of our friend and co-worker Dr. George E. Nettleton this association records the loss of one of its true and earnest members, one who, while of an extremely retiring disposition, was always on the alert in consideration of the association's welfare; and

Whereas, Our profession loses a representative member and an earnest worker, who for more than thirty years had been honored and trusted by a large *clientèle*; whose positive yet affable nature won for him in an exceptional degree the respect and confidence of his patients; he was also a warm friend and helper to many young men entering our profession. During many years' association, we never heard him speak a harsh or unkind word. His memory will always be cherished by this association, which will never cease to mourn his loss; therefore be it

RESOLVED, That we extend to the family of our departed brother our sincere sympathy in this hour of their bereavement; and be it further

RESOLVED, That these resolutions be spread upon the records of this association and a copy sent to his family.

During the past year there has been removed from our midst one in the prime of his life. Death, who it would seem should

have left him to have fulfilled what seems to us the full mission of life, has without warning removed one of our members, Dr. William H. Cahill of Hartford, graduate of the Philadelphia Dental College, about thirty-eight years of age. For several years he has been a member of this association, although not active in society work, and his death is mourned by his many friends.

DR. WILLIAM H. CAHILL.

Whereas, It is with regret that we have learned of the death of Dr. William H. Cahill of Hartford, which occurred on August 15, 1905; therefore be it

RESOLVED, That in the death of Dr. Cahill the association has lost a conscientious, kind-hearted member, and one who although not so active as some in the affairs of the association, was always in sympathy with its best interests; and be it further

RESOLVED, That these resolutions be placed on the records of the association, and that a copy be sent to his brother.

Respectfully submitted,

E. S. GAYLORD, *Chairman pro tem*.

Dr. McLEAN moved that the report of the Committee on Necrology be accepted as read.

The motion was carried.

The Committee on the President's Address was next called upon.

Dr. C. W. STRANG. In so far as the recommendation contained in the President's address regarding raising the dues is concerned, your committee has carefully considered the matter, and after due deliberation would recommend that the annual dues be increased one dollar, and so raising them to three dollars per year. I would suggest that this be presented to the society in the shape of a resolution, to be acted on finally at the next annual meeting.

Dr. G. O. McLEAN then presented the following resolution:

RESOLVED, That Article 4, Section 1, shall be changed to read: "Active members shall sign the Constitution and pay an admission fee of three dollars, and annual dues of three dollars in advance."

The report of the Nominating Committee was next in order, which report was as follows:

President—A. W. Crosby, New London.

Vice-president—F. Hindsley, Bridgeport.

Secretary—E. S. Rosenbluth, Bridgeport.

Assistant Secretary—A. V. Prentiss, New London.

Treasurer—W. O. Beecher, Waterbury.

Executive Committee—F. T. Murlless, Jr., Windsor Locks; F. W. Brown, New Haven; and F. J. Erbe, Waterbury.

Motion was made and carried that the report of the Nominating Committee be accepted, and that the secretary be instructed to cast one ballot for the entire list of nominations for the ensuing year.

Drs. Gaylord and Brown were asked to conduct the new president to the chair.

Dr. GRIFFITH, in retiring from the office of president, said:

Dr. Crosby, I am very glad to turn over to you the duties and responsibilities of the office which you are about to occupy for the coming year, trusting that the support and encouragement which has been accorded me will also be yours. Because of our faith in your ability to conduct the affairs of the association we have no hesitancy in committing those affairs to your care for the ensuing year. I congratulate you.

Dr. CROSBY, in accepting the office, said:

If I am to be fortunate enough to receive the support and encouragement accorded the retiring president, and fortunate enough to make the meeting in New London as successful as this one has been, I shall be very proud. Gentlemen, I appreciate the compliment you have paid me in electing me to this office.

Dr. McLEAN. I move that a vote of thanks be extended to the various essayists and clinicians and the retiring officers for their efforts in making the meeting a successful one. I would also like to include in that a vote of thanks to Dr. Anthony, the COSMOS reporter.

The motion was carried.

There being no further business before

the association, motion to adjourn until the next annual meeting was made and carried.

THE CLINICS.

Dr. H. E. HOSLEY, Springfield, Mass. "Method to Prevent Shrinkage in Soldering Bridge Work."

The clinician claims that the reason of a bridge binding is because of the shrinkage in soldering, and to overcome this he cuts the model, and spreads the abutments apart sufficiently to allow for such shrinkage. The space, of course, is in proportion to the size of the bridge to be made. A groove is made at the bottom of the model to insure the proper position of the abutments when the model is again fastened together.

Dr. W. B. DUNNING, New York, N. Y. "Manipulation of Non-cohesive Gold on the Wedging Principle."

The instrument used in this clinic was a sharp four-sided wedge-shaped plugger—a single joint without serrations—and the gold used was Abbey's foil No. 4. The gold was rolled by hand into the form of pellets, and packed vertically against the walls of the cavity, finishing the wedging process toward the center. A liberal surplus was worked down to a hard dense surface by alternate wedging with the instruments named and rolling by means of a finishing bur, under hand pressure. The method was recommended for small, simple cavities, in which perfect adaptation of gold to the cavity walls may be quickly and easily obtained, the resulting filling being dense and in every way serviceable.

Dr. A. J. CUTTING, Southington, Conn. "A Process of Burnishing Gold."

Dr. Cutting's method consists of using either cylinder or foil, and with smooth points of suitable shapes that will reach every part of the cavity, of rubbing or burnishing each piece to place. Anneal the gold as required and use blued instruments, made so by the application of heat. No larger piece of gold should be used than one that can be thoroughly

condensed by the pressure of the bur-nisher.

Dr. M. R. BRINKMAN, Hackensack, N. J. "A Simple Method of Replacing Broken Facings on Crowns and Bridges."

The instruments necessary for the clinician's method consist of two drills—one for the regular handpiece and one for the right angle—one die, one tap and holder, one wheel bur, and one pair of pliers.

To repair a facing proceed as follows: Cut the pins from the backing, and with a small carborundum stone slightly concave the backing so that the facing will bear firmly on the edges of the former. Select the proper tooth. Hold it carefully in the required position, and mark with a pointed instrument the exact points to be drilled in the backing. Drill the holes, slightly diverging from the center, then use the tap to cut the thread in the latter. With the wheel bur cut a groove on the palatal side of the backing, between the holes, for clinching the pins. Take the die, and cut a thread on the pins of the tooth. At this stage of the process the tooth will be ready for cementing to place. Mix the cement fairly stiff, apply to the backing, and force the facing firmly to place. Hold it in position, and with the pliers pinch the pins into the groove; allow the cement to set, and then grind the pins flush with the backing. This completes the operation.

The special point of retention which differs from those in other methods is the interlocking of the thread on the pins with the thread in the holes of the backing. Two other points of retention are the cement and the clinching of the pins, which have been in vogue for some time. By using a small inverted cone bur, and cutting out the cement on both sides of the pins, a gold or alloy filling can be inserted in the backing, although it is not absolutely necessary for the permanent retention of the facing.

GEORGE T. BAKER, Boston, Mass. (Chair clinic.) Demonstration of Use of Thymoform: (a) Permanent Root-

Fillings; (b) Disinfecting Dressing for Infected Pulp-Canals; (c) Mummifier.

The patient presented a lower right first molar, which had caused him considerable discomfort for a long time. Almost the entire crown had been lost by caries. The caries had progressed to such an extent that the floor of the pulp-chamber, as well as the sides of both the anterior and posterior canals, were perforated. The roots were mere shells. There was not enough tooth-substance left to warrant the attempt to save it. In addition, the root was the seat of a chronic alveolar abscess with fistula. The whole tooth was in such a bad condition that for the best interests of the patient the question of extracting the tooth was seriously considered. Had there been sufficient tooth-substance to warrant its salvation, the perforations of the chamber and root-canal walls could have been capped with gutta-percha, while the abscess sac on the roots and the infected periapical tissue would doubtless have yielded to proper treatment. However, the interests of the patient are paramount, and we shall not attempt to save this tooth.

It will nevertheless serve to illustrate the use of thymoform, which consists of a liquid and a powder. The former is a five per cent. solution of thymol in glycerin, while the powder is a chemical combination of thymol and formaldehyd, mixed with absolutely pure zinc oxid. The proportion of the former to the latter is approximately five per cent. This agent disinfects by the slow diffusibility of the thymoform, which, as already stated, is formaldehyd in combination with thymol.

The fluid being hygroscopic, the moisture of the canaliculi is disinfected, and the whole tooth is thus rendered aseptic.

It is interesting to note that the periapical infection has been brought about by the infectious material of the decomposing pulp gaining access to the periapical tissues through the foramen. Now, where these infectious elements have penetrated, the disinfecting formaldehyd will as surely follow. The result will be the destruction of all pathogenic germ

life, an effectual removal of the cause of inflammation; and once the cause is overcome, one may confidently expect a return to normal conditions. The conditions of pulpless teeth are so varied that good judgment must be used in all cases. No two cases are ever exactly alike. If there be a fistula present, it is well to force a mild caustic fluid through it until it appears on the gum. In the case of an upper molar or bicuspid, due care must be used not to enter the antrum, and in the case of a lower third molar one must remember that the inferior dental nerve is often in very close proximity to the apical foramina. It is proposed to fill the lower left second molar, which is badly decayed, though the pulp is not quite exposed. The anterior and posterior occlusal cavities were united into one. The soft cheesy dentin immediately over the pulp was bathed with a solution of silver nitrate, ten grains to the ounce of water. The dentin was dried, and coated with a varnish of resin and chloroform. A very thin capping of gutta-percha was introduced to guard against thermal changes, and the cavity filled with amalgam.

Dr. WALTER H. ELLIS, Buffalo, N. Y.
 "Duplication of Models" (elastic molds).

Materials. (1) One-half pound best grade French gelatin. (2) Stearin mixture (2 dwt. stearin, 1 oz. kerosene) for painting molds to prevent the gelatin from adhering to the cast. (3) Alum-water prepared by dissolving one-half pound powdered alum in one teacupful of boiling water. (4) Soapstone to be dusted on cast to preserve whiteness.

Synopsis. (1) Brush thoroughly the cast to be duplicated with powdered soap-

stone. (2) Coat the inside of the wooden case with the stearin mixture. (3) Stick the cast to hinged portion of the case by means of a pellet of gum or clay, then shut the case and clamp it. (4) Melt the gelatin in a double boiler, in the proportion of two teacupfuls of hot water to one-half pound gelatin. Stir the mass while melting it, and when thoroughly melted remove it from the fire, and cool to a degree where it feels neither hot nor cold to the finger. (5) Pour the gelatin into the case through the hole in the roof of the case; let the mass stand for seven or eight hours, preferably over night, until it has hardened. (6) Remove the mold from the case and work the cast carefully from the mold. (7) Allow the mold to stand for one-half hour to harden, and then return it to place. (8) Brush the surface of the cast with soapstone, and then with the alum-water. (9) Give the mold a light coating of stearin mixture. (10) Run the first duplicate. (11) Watch carefully, and as soon as the plaster has set, and just before the heat incident to the setting begins to be generated, remove it from the mold, as any degree of heat injures the latter. (12) Give the surface mold a dusting of soapstone, and a coating of stearin mixture previous to the running of each duplicate. About six duplicates (good ones) can be made from one mold.

Dr. P. B. McCULLOUGH, Philadelphia, Pa. "The Artificial Substitution of a Single Missing Central or Lateral Incisor." (This clinic was later made the subject of a paper read by Dr. McCullough before the New York Institute of Dental Technique, and will be found in the Transactions of that body for 1906.)

MASSACHUSETTS DENTAL SOCIETY.**Forty-second Annual Meeting.**

(Continued from vol. xlviii, page 1255.)

SECOND DAY—Morning Session.

The meeting was called to order on Thursday morning at 9 o'clock by the president, Dr. J. J. F. McLaughlin.

The first order of business for the morning session was the reading of a paper by Dr. VIDA A. LATHAM, Chicago, Ill., on "Cysts of the Oral Cavity."

[This paper was published in full in the September 1906 issue of the COSMOS, vol. xlviii, page 905.]

Discussion.

Dr. M. H. CRYER, Philadelphia. I have not the ability to properly open the discussion. The paper itself is a classic, complete in all respects, and to discuss it intelligently one should have had an opportunity of reading it previously, so that one could study the paper and the subject carefully, as the essayist has done.

I may say a few words about the glands spoken of. All three are called salivary glands, but they are quite different in their anatomy, and the secretions vary as much as to their chemistry. The parotid is purely a salivary gland; the sublingual is a mucous gland; and the submaxillary is both salivary and mucous. As these secretions differ, the character of the cysts associated with them will vary; the position of the glands and their outlets into the mouth also vary greatly. The essayist, if I remember correctly, said that we seldom have cysts of the parotid gland. The reason for that is, that the gland as a whole is situated about on a level with the outlet of the duct, and the attraction of gravity allows the fluid to go forward into the mouth. The muscular action also favors this gland; every

time the mouth is thrown open there is a pressure which remains so long as the mouth is open, which helps to force the fluid from the gland through its outlet. Cysts of these glands are usually of traumatic origin. Again, cysts in the sublingual gland are not so common as in the submaxillary, because the former is in the floor of the mouth, covered only by mucous and submucous tissue, and has numerous outlets. While the greater portion of the submaxillary gland is situated outside of the mouth under the mylo-hyoid muscle, the duct commences within the gland, passes backward to the posterior or free border of the mylo-hyoid muscle, then upward and forward above the muscle, and terminates near the frenum of the tongue. It is in the upper portion of this duct that cysts are most common; they are often spoken of as ranula. Sometimes cysts within glands, especially the submaxillary glands, are mistaken for tumors, and it is important that a true diagnosis should be made in these cases before the operation.

There is nothing further I can add to this discussion except to heartily congratulate the essayist.

Dr. M. C. SMITH, Lynn. This is a subject that I am not properly prepared to discuss. I think the essayist has gone over the ground from a pathological standpoint in a very excellent manner. I may say a few words in regard to the treatment of such cases: When we get a case where there has been a stoppage of one of the ducts of these glands, we need to "get a hurry on" for the benefit of the patient, who wants something done, and done right away. I have seen more cases, I think, of stop-

page in Steno's duct than from other glands. The first one I remember was a complete stoppage of Steno's duct due to carcinoma, and it was one of the most wicked things I ever saw, until an opening was made into the duct. I have a case in mind of a lady who, in throwing her head down, would in some way clog up the duct, and it would immediately fill up with saliva until it assumed the proportions of a good sized hen's egg; immediately upon rising the obstruction would cease to exist, and the gland would discharge its contents into the mouth.

In opening into these cysts under the tongue I always prefer to make two openings if possible, and put in a seton, so that it will be impossible for them to close up. If you cannot get two openings, be sure that you get a packing in there so that it will remain. This may have to be kept in some time, for if left out, the opening will heal up very quickly; indeed, sometimes in a few hours, and you have a filling up of the cyst. A very small packing dipped in a saturated solution of silver nitrate and put in is one of the best things that I have ever been able to use. In fact I make it a general practice to take a fine broach, wrapped with cotton and dipped into the saturated solution of silver nitrate and pack this in these small cysts, leaving the cotton in and removing the broach. That will give you a good drainage, with as little bad results as anything I have ever been able to find. You get some drainage through the place left by the broach, and the silver nitrate keeps the parts from healing.

Dr. ISADORE LETT, Boston. I have a very interesting case to present in this connection. It is a case of suspected ranula, sent me after several surgeons had looked at it and decided that it was an affection proceeding from the teeth. I decided to take out the sublingual gland, expecting that would cure the case. A swelling would rise in the mouth, and on puncturing the swelling the contents were found to be a mixture of saliva and mucus. Before operating I introduced silver nitrate, but that did no good; then I used zinc chlorid, and after

failure in that direction took out the gland. The wound was kept open with packings for three weeks, and after these were removed the condition recurred, with considerable pain along the inferior dental nerve and back of the ear. I then introduced a probe two and one-half inches in the direction of the submaxillary gland. The condition did not improve under treatment, and I decided that the submaxillary gland would have to be removed. That has been effected, yet the same condition is still present, and I cannot understand where the fault lies. I have not been able to get a microscopic section from it, because the pain would start immediately before the swelling, and in half an hour the tumor would be formed in the mouth; then, before the patient could reach my office, it would break and discharge in the mouth. About a week ago the patient told me that he cut himself with a fish-bone in that location some years ago, and that was the commencement of the trouble. However, I have not been able to make a diagnosis leading to a cure of the case. These little tumors will spread in different parts of the mouth, and the moment they break the pain is immediately relieved.

Dr. LATHAM (closing the discussion). I wish to thank the members of the society, and especially Dr. Cryer, for the kind words spoken of the paper. I only want to say in regard to the subject that the work is certainly interesting, and if I may say it, I think it behooves every dentist to be on the lookout and watch for these conditions.

The next order of business was the reading of a paper by Dr. EUGENE S. TALBOT, Chicago, Ill., on "Errors in Dental Education."

[This paper was published in full in the July 1906 issue of the *Cosmos*, vol. xlviii, page 731.]

Discussion.

Dr. EUGENE H. SMITH, Boston. When I was asked to discuss Dr. Talbot's paper on the "Errors in Dental Education" I

gladly answered, Yes. I did not realize until I read the paper that he would touch upon matters other than education; but he has seen fit to discuss not only the past and present methods of dental education, but to severely criticize much of the technical side of dentistry, that many of us consider an advance over past and cruder methods. I do not agree with him that the art of filling teeth has not progressed in the past fifty years.

It may be quite true, as he says, that the principle of cavity preparation is much the same as it was a half-century ago; but much of the technique has changed, and the treatment of the cavities after preparation is quite different. I look upon the different inlay restorations as a distinct advance in operative dentistry. They have in a great measure supplanted the large, malleted cohesive contours that were so exhausting to patient and operator, and furnished us with a remedy for caries more compatible with tooth-substance, and, as in the case of porcelain restoration, more artistic.

In the construction and adaptation of artificial dentures, the work of Bonwill, Gritman, and Cross in the field of anatomical occlusion has been a notable step in advance. Crown and bridge work, though much abused in application, has had and still has its legitimate uses. It is quite true that in normal conditions the bridging from tooth to tooth is contrary to well-known physiological laws. So are many of the surgical operations of modern surgery, yet we are justified in resorting to it in many cases. Judiciously applied and skilfully executed, crown and bridge work proves a healthful blessing to many of our patients, and delays the undesirable hour of plates.

In orthodontia within the past few years much has been accomplished. Normal occlusion and its importance have been written by Angle in letters of gold. The technique, to which many have contributed, has also been greatly improved. Errors in this branch of our work are being made, no doubt. So are errors being made in science and research. The science of today is not the science of yes-

terday, and the science of today will not be the science of tomorrow.

Our essayist stated that deans of dental schools and editors of dental journals give no credit to the research work of scientific men. I think that upon second thought he might be induced to make a few exceptions to this wholesale charge, and especially so in my case, when I assure him that the testimony of my students will bear me out when I say that his valuable work receives full credit in my classroom. I cannot believe that I am the only one who gives honor to him and his co-workers.

Heartily do I indorse, with the essayist, the saying of Emerson, that no man can learn that which he has had no preparation for learning. It has been with this in mind that the faculty of the Harvard Dental School has, to its cost in its number of students, steadily advanced the entrance requirements, and maintained a broad and severe training in the fundamentals of medicine. I am, however, at this moment inclined to believe that the college or academic graduate is frequently poorly prepared for professions that require so much technical skill as do dentistry and surgery. Certain am I that the student who contemplates entering upon our profession should, on his way to his degree in arts or science, elect in a generous way the natural sciences. He must early be taught manual training, and follow such studies as will develop his powers of observation. It is always pleasant to speculate on the possibilities of preventive medicine, and to encourage and assist the scientific investigator. The powers of the practitioner and those of the scientific investigator, however, cannot find their full development in one man. Skilled practitioners we have, and what the dental profession most needs at the present time is thoroughly trained scientific men who can devote their whole time to dental research. This can only be brought about through properly endowed dental schools. The millennium, however, is yet a long way off.

The multitude, although knowing how to live, will not lead such lives but that a

large army of practitioners will be kept busy treating disease and repairing the waste. It behooves us, then, to say a good word for the man of practice as well as for the man of science, and to provide in our dental schools such courses as will foster the scientific spirit, and at the same time produce the intelligent and skilful practitioner.

Dr. GEORGE A. BATES, Boston. I have been much interested in the paper by Dr. Talbot. His statement that dentistry has made no progress during the last thirty years, brings to my mind two incidents which occurred more than twenty years ago. I happened to be in the office of a friend in a neighboring large city, and while I was there a gentleman came in who was a practicing dentist in the same city. After some casual remarks he, in a self-congratulatory tone, said, "I have cleaned out five mouths this morning"—it was then about nine o'clock. I drew a mental picture of the gentleman's office, and seemed to see a line of patients sitting there waiting to have their mouths "cleaned out."

I have another recollection which takes me back twenty years. In this instance, a man had in his mouth a porcelain crown which had become loosened. He had come into the dental office to have it readjusted. During the operation I discovered that the crown was set on a hickory post; I also learned that the patient was obliged, every six months or so, to have the same operation performed, because caries had penetrated into the root-canal and enlarged it so that the post would no longer remain tight. At each operation it was necessary to insert a larger post until, at last, came the inevitable extraction.

I have a crown in my own mouth which is in strong contrast with the one just mentioned. This crown is anchored in the root with a platinum pin. Over the end of the root is fitted a platinum cap, through which the pin passes. The dentist who put on this crown understood the anatomy of the tooth and surrounding tissues, so he did not make the band deep enough to wound the gingival border. Over the cap is fused a porcelain

crown, the porcelain covering the cap entirely, so that no metal comes in contact with the gum tissue. It is a thing of beauty, and I trust will be a joy forever.

Some present will remember how twenty years ago most of the dentures that came under observation were of the horseshoe variety. I am sure the dentures made by the dentists of today mark the wonderful improvement in plate work which has been achieved in the past twenty, not to say thirty years, the statement of the essayist to the contrary notwithstanding.

I cannot agree with the doctor when he says that the porcelain inlay is not an advance in dentistry. It is a distinct advance that we are able to use porcelain as a tooth-filling material. The essayist says, the tooth will discolor with age and show contrast with the inlay, however nicely it may be matched. What of gold fillings from the beginning? Is not the contrast much more striking; and in the case of the inlay, does not the patient have the benefit of the time before the tooth discolors, during which he has a filling that cannot be discovered by the ordinary observer? The difficulty of finding a cement that will hold the inlay in place is a detail that will be overcome in time, and one which I think the essayist has very much overestimated.

The essayist has spoken of "a cement that will take the place of the inlay, and which will have the permanence of gold." This is a much to be desired consummation. When we have a cement that will preserve the color of the tooth and will at the same time be permanent, it will indeed be a benefaction to both patient and operator. In the meantime we can do much with the porcelain inlay, and save our patients the unpleasantness of the ghastly exhibitions of the goldsmith's art.

I want now to address myself particularly to the subject of dental education. The question raised by Dr. Talbot presents the proposition, How shall the dentist be educated? I would not undervalue the advantage of a college education, for whatever one's position in life

a college training is of great advantage, all things being equal. But unless a man be possessed of special qualifications, a college training alone will not fit him for his work in dentistry. We are educating *dentists*, and whatever may be said about higher education in dentistry, we must not lose sight of the fact that a very large part of the work that the dentist is called upon to perform is mechanical. This is a fact, whether we are willing to admit it or not.

The dental student first of all should be possessed of a good working knowledge of English, for he is to be a professional man, and must take and hold his place in society, and be able to speak and write intelligently. In his work he is constantly coming into contact with mechanical problems, therefore he needs mathematics and physics. In the course of his studies he will be called upon to know something about the processes going on in the body, which will require more or less knowledge of chemistry. Of Latin and Greek, he needs the former for roots and derivations; the latter not at all, for it is only essential for classical scholars, and it is not the business of the dental school to teach the classics. A reading knowledge of German is very desirable, since a large part of the literature of biological science is published in that language. With such an equipment the student is ready to begin his training in the dental school.

Let us suppose two men entering a dental school, one with natural literary ability and the other with natural mechanical ability. Make an equation with these two factors, each representing an equal quantity. Add a college education to your equation, and the man who has the mechanical ability will become a dentist, while the other will never make a dentist whether he possess the college education or not.

The first man, with the preliminary training already mentioned, will be just as good a dentist without as with a college education. Why waste his time acquiring an equipment in college which, while in many ways desirable, will not in any material sense increase his efficiency

in the practice of his chosen profession? I wish it to be clearly understood that I do *not* underestimate the value and desirability of a collegiate training, but I do say that it is not a *necessity* for the dentist. Men who come to the dental school are, as a rule, such as cannot afford to attend college. This is true as to time as well as of material resources. They must get to their life-work by a shorter way or choose another occupation. It would seem that we might educate our dentists by giving them just the necessary preliminary training before entering the dental school, and use the time thus gained in such teaching as will have a definite and vital relation to the work which the practice of dentistry will call upon them to perform.

As to the courses of study in the dental school, I am inclined to agree with Dr. Talbot, but too much stress has been laid upon original investigation; this, I think, is a weak point in his essay. Investigators are born, they are not made. You cannot educate a man to become an investigator, unless he have natural endowment for the work. The man who is so endowed by nature will be an investigator no matter what his occupation in life.

There seems to be much confusion among people who write for dental literature concerning the meaning of scientific investigation. This is shown by the almost endless repetitions which are constantly occurring in the dental journals. How often do we read how to treat a root-canal under varying conditions of disease. How many papers have been written on the proper method of treatment for that much-talked-about and little-understood bugbear of dentistry, pyorrhea alveolaris. How often do we read about numerous other subjects legitimate to the dentist, and yet not a single *scientific* investigation has thus far been made. These subjects have been touched upon, and every man who has thus far attacked them has done so without reference to the work of others, and has treated them as if he were the first man to give the matter attention. This is not scientific and is distinctly dishon-

est, yet neither the man who uses another's scientific property, nor he from whom it is taken, knows enough about scientific usage to understand that any wrong has been done. The very first principle of scientific investigation calls upon the investigator for a sufficiently adequate knowledge of the literature of the subject to prevent just these errors. If a biologist were to present a paper which purported to be an original investigation to any scientific journal, and it should prove to be a repetition of something already published, the paper would be at once refused, and the author would be held in suspicion by all biologists who knew the facts. And yet, in our own profession, we see this going on continually, because the publishers of the dental journals either do not know or do not care.

There are only a few investigators, for reasons already stated. Out of thousands of men engaged in the practice of medicine, how few there are who can lay claim to this distinction.

The essayist puts much emphasis upon the need of the study of the central nervous system and evolution. Of the central nervous system we know comparatively little. Indeed we are just coming to the study of this system on general principles. There are multitudes of problems which surround the subject, and I wish to cite a few of the simplest, just to show how little we know of the elementary structures of this complex system, and that there are problems that cluster around it no matter where you touch it; also to demonstrate that we are not warranted in making deductions or drawing conclusions with the present state of knowledge.

Here are a few of the simple problems: How are the spinal ventral nerves developed? Are their fibers produced by processes of single neuroblasts, or are they due to the migration of successive neuroblasts out through the limiting membrane of the primitive medullary tube? On the answer to this question is based one of the principal arguments in the controversy now in progress over the neuron theory. Take, for example, the nerve fiber; this is one of the simple ele-

ments of the nervous system. What is the origin of the neurilemma? Is it the product of the spongioblasts which go out with the migrating neuroblasts, or is it developed from the mesenchymatous tissue which surrounds the developing fiber? We know comparatively little about the nerve cell. What is the nature of the stainable substance of Nissl? Are the varicosities on the dendrites artifacts? What is the function of the fibrillæ which permeate the cytoplasm and project into neurite and dendrite? Does the nerve cell ever divide? How do its cyto- and nucleoplasm differ from those of other body cells? These are problems which have to do with the very simplest elements of this complex system. For many years the brain has been studied, and yet how very little is actually known about it. A few regions have been provisionally mapped, but the rest is more or less unknown. The great and all-important problem that concerns the nervous system is the neuron hypothesis, and this is at present in debate. Shall we give up the neuron theory, upon which all our present knowledge of the arrangement of the nervous system is based? These are some of the problems awaiting solution, and I can count on the fingers of my two hands, out of the hundreds of men in the world engaged in the branch of science that deals with the nervous system, those who are competent to attack these questions.

The essayist has spoken of the evolution of the nervous system. Evolution is a much-talked-of subject and one about which the most vague notions are entertained. What do we know about the evolution of the nervous system? Only the other day I heard a gentleman talking about the bony tissues of the mouth keeping pace with the evolution of the central nervous system, evidently not knowing that the growth and integrity of bone is a process of metabolism, and that this process is the product of the chemistry of the cell; also that it acts by chemical affinity, without special reference to the nervous system, or at least to a limited extent, and then through the involuntary nervous system, which acts independently

of the brain and spinal cord. The process is the same in the leg of a frog as in the human mouth, and the bone in one does not differ from that of the other. The subject of evolution is at present passing through a great battle which, while it does not disturb the basal propositions of the science, affects materially the matter of factors, and until some conclusions are reached in the present discussions, the least said about it the better.

There are many problems in the field of dental science awaiting answer, but they must be attacked by men who have had the training and know how to do the work. Some such men we have, one of whom is sitting here in this hall while I speak—Dr. R. R. Andrews of Cambridge, who is a pioneer of dental histology in America; J. Leon Williams of London is another; to these two men is due in great part our present knowledge of the development of enamel, while the discovery and demonstration of the *Zahnleiste* or tooth-band by Carl Röse, marks an epoch in the study of dental embryology.

Let us look for a moment at some of the problems which address themselves specially to us as dentists. I speak from my own specialty because I am most familiar with it.

First: How is dentin developed? Does the odontoblastic cell furnish the material for the development of the matrix of the dentin, or does it come from the ground substance of the connective tissue of the dentinal papilla?

Second: Is the first enamel developed from material which is locked up or stored in the meshes of the stellate reticulum of the enamel organ? What is the purpose, origin, and nature of the internal enamel membrane described by Leon Williams?

Third: What is the nature of the vital connection, if such there be, between the alveolo-dental periosteum and the dentin? How is sensation conveyed through the dentin to the pulp without the presence of nerve tissue in the dentinal fibril, or does such exist in these structures? These are a few of the many problems

which address themselves particularly to the dentist.

When Dr. Andrews, at the International Congress assembled at Chicago, read his paper describing the fibers which extend from the ameloblastic layer into the stratum intermedium, there was little or no discussion, and the reason is not far to seek.

There is plenty of opportunity for investigation in the legitimate field of dentistry. Most of the work of this nature, however, has thus far been done by people outside the profession. Many of the problems in the pathology of the mouth can more readily be solved with a more extensive knowledge of embryology. This science of development is the foundation of all branches of biology, and when dentists have a better understanding of the fundamental sciences, we shall hear less about new remedies for pyorrhea alveolaris, and more as to its probable cause: then we shall know that it is not a disease in itself, but the result of some perhaps remote systemic condition which finds expression in the mouth. When that time comes, if it ever does, our dental literature will be purged of much of the worthless material which at present mars its pages.

I disagree with Dr. Talbot in many of his propositions, but I find myself entirely in agreement with him when he says that the reason for this condition of things is that dentists will not see over the cusp of a tooth.

In closing, there are a few things I wish to emphasize: First, I wish to express my entire agreement with Dr. Smith in his statement that dentistry did not write its last word thirty years ago, and that we do have better methods of working, and that dentists do better and more skilful work today than was done thirty, fifteen, or even ten years ago. Second, that a college education is not essential for dental students. If we are to put that necessity upon them, as preliminary to their entrance into the dental school, we will empty our dental schools and will not improve the profession.

During many years of experience as a

teacher in a dental school, I have had a large number of men under personal observation, and I am sure the profession of dentistry would have been robbed of many useful members if a college education had been a necessary equipment for their entrance into the dental school.

Here in Boston, I could point out a number of men of this character who have been my students, and who occupy high places as intelligent men and good dentists; men who are not a disgrace to the profession, but by whom the profession has been made better, broader, and richer, because of their entrance into it. So I will say, let us educate our students as dentists; let us recognize that mechanics enters largely into the warp and woof of dentistry; that investigators are not made, they are born; that the man who is an investigator, if he has the groundwork which I have suggested, will be amply able to do any work or attack any problem which may come to him legitimately.

I had wished to say something about the statements made by the essayist concerning the conduct of dental school teaching, but Dr. Smith of Harvard has covered the ground so fully and so well that I forbear.

Dr. JAS. McMANUS, Hartford, Conn. You have heard from three professional educators on this subject. Dr. Talbot has covered the ground very fully and very exhaustively; Dr. Smith very pleasantly; and the last speaker has told us a great deal that we know to be true. What I want to say on the subject is this: that if the dental colleges have made any mistake in the past, it is because they have failed to impress thoroughly on the minds of the students the necessity for study, continual study, after they leave college. Good old Professor Garretson, who talked so much about the "A B C" of dentistry, and dwelt so much on principles, used to say, "It is our duty as teachers to teach you young men principles, and impress upon your minds the necessity for study after leaving college. And we are trying to teach you to study hereafter, and to know where to look for information on any subject which comes

up, for further instruction." Now, the trouble in the past has been that they have given a little bit, but not enough, of the history of the profession, and they have not impressed strongly enough the necessity for study after leaving college. If you take many of the men who have read papers for the past few years, they have come before us to read papers which many of us have read in the earlier volumes of the DENTAL COSMOS; we know that the same things have been written and talked about years ago, and yet they are brought forward as something new.

I want to say this with reference to the teaching of the past: You had last night from Professors Brown and Cryer some wonderful exhibitions, and you have had today from our good friend Dr. Talbot a very helpful paper. I can remember when all of these men were simply dentists, practicing dentists. What are they today? They are students and scientific men, and it is a great pleasure to see what Dr. Brown has done with those malformed children to make them presentable. But here is the point: He first had a good education in the dental college, and has learned to use his fingers, and knows how to operate. His dental education has made him the surgeon that he is today. And the same thing applies to Dr. Talbot and Prof. Cryer. We have had a few men in the dental profession who have been students, and have continued to be students; they are investigators, but it is hardly possible to expect this of a majority of the students. Just as the last speaker said, some men are born with certain gifts, but the majority of our students are not. I think today that the dental students will rank with the medical students in this respect. Take any class of medical students of two hundred, and I doubt if there are ten men in that number who will stand prominently before the public as great men. So the majority of our students are simply dentists. There are dentists, and there are professional men. And I never had this so forcibly impressed upon me as at this meeting of the American Medical Association. Go over to that exhibition, and you will see numerous

appliances, and many other things; you will also see several booths filled with scientific and medical books. These books are there for the medical men to examine; they are on scientific medical subjects. They are expensive, and cannot be published unless they have readers, and that means that medical men are readers. I have never seen an exhibition of dental books at a dental meeting. I see no evidence that the majority of our men are readers. They say they do not have time; after a man finishes his daily work he hardly has time to read a magazine. Talk about trade journals; they would do a lot of good if men read them, but they do not.

In closing, I do want to say that the dental schools of the past have done great work, as illustrated in that we have such men as Dr. Cryer, Dr. Brown, Dr. Talbot, and others.

Dr. TALBOT (closing the discussion). I wish to say in closing the discussion that I would use the arguments of the two principal speakers to prove my case.

There being no further business before the society, the president, Dr. McLaughlin, declared the meeting adjourned until the next annual meeting.

On Thursday night, June 7th, a banquet was tendered the members and guests of the Massachusetts Dental Society at Young's Hotel.

After the banquet was served, Dr. J. J. F. McLaughlin, toastmaster, called on several of the members and guests for speeches, after which he introduced the speaker of the evening, Prof. J. H. MONTAGHAN of Washington, D. C., who addressed the assemblage on the subject of "America a Land of Unlimited Opportunities," as follows:

AMERICA A LAND OF UNLIMITED OPPORTUNITIES.

Last year and the year before, dealing with a subject somewhat similar to the one selected for this evening, "America a Land of Unlimited Opportunities," I dealt in more or less detail with certain

facts and figures of startling suggestiveness and stupendous significance. I shall briefly run over these figures. They deal with our fabulous wealth and our marvelous powers of production. In the first place the United States is the richest country in the world. Concreted into a mathematical expression our wealth has been put at \$110,000,000,000. Such stupendous figures stagger the imagination, for they are far beyond the power of the scientist's, much less the ordinary, mind to grasp. When an Indian runs down from the woods to Washington to see the President, he makes a note of all he sees. When he goes back to the forest he tells his tribesmen that the number of the people he saw were as the stars in the sky at night; as the leaves on the trees, or as the grasses in the field. From the Indian's picturesque and graphic language, his companions get a fairly good idea of the multitudes in the eastern cities, but when I talk to you today of \$110,000,000,000 you have hardly an idea of my meaning. If, however, in order to help you to understand by a comparison, I tell you that our wealth—piled up in a little over a hundred years—is \$110,000,000,000, while the wealth of Great Britain—a nation that sent tin to the Phœnicians and gold to the Cæsars—has only \$55,000,000,000, you begin to get a better idea of what the wealth of the United States is. France, "la belle France"—land of thrift, of olive orchards, wonderful vineyards, of flowers, of the finest fabrics, from the art works of Paris to the Gobelin's tapestries and Sèvres china—has piled up in nearly twenty centuries only \$50,000,000,000; Germany, including Alsace and Lorraine, has only \$45,000,000,000; Russia, with a sixth of the globe under its scepter and a tenth of the world's people, has only \$35,000,000,000; Austria, including the Kingdoms of Hungary and Bohemia—romance lands, all of them borderlands of the East—has only \$30,000,000,000; Italy, descendant of the Romans—with its wonderful past, its cities of all its Cæsars, its Venice, Florence, Milan, Amalfi, Rome, and Naples—has only \$18,000,000,000; while Spain, that took

billions—not millions—from the Incas of Peru and the Montezumas of Mexico, is last in our list with only \$12,000,000,000. Against all these our country has \$110,000,000,000.

Last year I put our power in another way; and it is particularly of this power that I shall talk today. I told you that our producing capacity was as follows, expressed in percentages of the world's entire products: Wheat, 22; gold, 30; coal, 32; silver, 33; manufactures, 34; iron, 35; cattle, 36; steel, 38; petroleum, 50; copper, 75; corn, 84. I have to change those percentages this evening. We have long passed beyond the 32 per cent. limit in coal, beyond the 34 per cent. limit in manufactures, beyond the 35 iron and 38 steel. Today the tables tell us that our iron and steel productions are nearer 50 per cent. than they are to the old tabulation. We are now the world's greatest, if not its most wonderful manufacturer. You see I am discreet, if not wise. I say we are the world's greatest manufacturer, not its most wonderful. I take my hat off to France, Germany, and England. We produce quantities; they still stand for qualities. In saying this I hope I shall not be accused of disloyalty to my own people. The purpose of this lecture, as I take it, is the truth. If the statistician stands for anything other than the truth he is a dangerous man.

The figures, then, of our wealth and our power to produce lead us to an analysis that is as suggestive as it is interesting. Whence came the wealth and the power? God Almighty made this land the most wonderful in the world, with the possible exception of China. Why except China? Why except any country? Well, for this reason. I want to be fair; secondly, I want to point out that China is the really great opportunity, the greatest in all the wide horizon of possibilities. We produce 22 per cent. of the world's wheat. When we get ready to till our fields as they till the wheat fields of France and Germany, the yield will be 33 per cent., or even more. Our corn yield is 84 per cent.; it could be made 90. The soil of this country is

among the world's finest. Tests have shown the soil of the Mississippi, Missouri, and Arkansas valleys to be among the richest on earth. Only the soil of Egypt and a few of the valleys of Asia can compare with them. The work of the Department of Agriculture, of Luther Burbank in California—inoculating the soil so as to increase its fertility, planting Persian peach, olive, date, and other fine fruit trees in California, Arizona, Oklahoma, and New Mexico, the removal of the spines from the cacti of the same states, converting the cause of disaster into the most succulent herbage of our cattle, giving to the world seedless apples, seedless oranges, pears, peaches, plums, grapes, etc., such as the world had never looked for even in the islands of the Hesperides—show what a world of opportunities is here. Talk of opportunities! Why the alkali plains of the West—once regarded as worse than deserts, dangerous to man and beast—are beginning to blossom as blossomed once the gardens of Semiramis, or the lands lying between the Euphrates and the Tigris, the plains of Mesopotamia or Persia. Irrigating waters wend their way out of our western hills into the orchards, vineyards, and gardens of a dozen states, transforming arid wastes into blooming vistas. In them all are found the splendid opportunities offered to the farmer and the farmer's children by the scientists of this and the last century.

As has been my wont in other years, I pause here long enough to put in parenthetically, but quite apropos, the wonderful work of a great scientist of France, Pasteur. I do this for a dozen reasons—but primarily to point out the fact that for the one opportunity presented to the boy Pasteur, a hundred are offered to the boys of this country. France lives upon the fruits of her olive orchards, her vineyards, her silk-farms, and her sheepfolds. All of these were suffering, in danger of death or extinction. Pasteur, who was a chemist rather than a biologist, went to work to discover the causes of the phylloxera ravaging the vineyards. He found it; found, too, that scions taken from the Mohawk Valley of New York, from Ohio,

California, and other states of this country resisted the phylloxera. These were put in place of the old vines, and France was saved. Her wine improved, if that were possible. The great scientist scored his success number one. I am not now paying particular attention to the chronological order of his successes. The sheep of France were dying by thousands. Pasteur went into the fields, watched the sheep grazing, learned the cause of the disease and eradicated it, although in doing so he had to encounter and fight the prejudices of an ignorant peasantry. The silkworms were dying. Pasteur went into the mulberry orchards, into the incubators, watched the worms at work, traced the disease to its source, and eradicated it. The bite of a mad dog leads to the most dangerous and most deplorable of all diseases—hydrophobia. Pasteur investigated that, wiped out the danger of it and when he died was at work on the bacilli of consumption, tuberculosis, and the bubonic plague. Again I say to the young scientists of this land, to those who are willing to work, there are bacillic and bug diseases by the dozen. To mention only one of the latter—there is the boll-weevil, the wiping out of which will mean as much to southern cotton fields as did the destruction of the phylloxera to the vineyards of France. There are millions and millions of opportunities on our farms, in our gardens and our forests. Why, until the latter are on a paying basis, and until they are saved from the wantonness and waste that has been ravaging them for over a hundred years, there is an opportunity for the statesman, the scientist, and the public-spirited citizen. An army of men is needed to put our forests in the condition one will find in the forests of Europe, particularly Germany and Austria. To organize the metric system will require a constructive genius. The forests, then, are full of opportunities.

THE MINES.

The world has a large, but after all a very limited supply of its great and important if not essential factors, coal and iron. Note what I say, important if not

essential. They are not essential. The romantic story of Italy's so-called industrial and commercial decline or decadence was very largely due to the fact that Italy had no coal, while her great rival—for two or three hundred years the world's great industrial and commercial master—England had thousands of square miles. When, in 1607, England began to apply coal to the manufacture of iron, thus getting a leverage such as would have delighted the soul of Archimedes, Europe had 14,500 sq. miles of coal; of these England had 10,560. This is what put Great Britain at the head of the world and kept her there till Anno Domini 1895, or thereabouts—or, in other words, till the coal and iron deposits of this country, backed by our cotton and corn, put it in our power to wrest from her the scepter of supremacy. The Old World's mines are worn out, or are wearing out, particularly England's; ours have hardly lost their upper layers. We have 225,000 square miles of new mines; Europe, 14,500 square miles of old ones. England will exhaust her mines in two hundred or three hundred years, while ours at the present enormous rate of production of over 300,000,000 tons a year are good for 6000 years. Only China—with 225,000 square miles, as recorded by Richthofen, the great German geographer and scientist, who spent twenty-five years in China studying its mineral resources as well as its agricultural possibilities—can compare with us, and I look upon China and the vast East as our greatest opportunity. Just as soon as the canal is cut, the Pacific puts our East with all its powers and possibilities in close touch with the Far East, where opportunities will be opened up to us as fast as evils flew out of Pandora's box. Our coal, copper, iron, gold, silver, and all other mines are opening myriads of opportunities to our chemists, engineers, mine managers, and all men of brain and brawn.

It would take hours instead of an hour, or five times ten minutes, the time usually taken for a talk of this kind, to do more than give you the outlines of the opportunities offered by the mines of the

country. Someone said you couldn't begin to describe the Colorado cañon without lying; so I say that any effort to paint the possibilities of our mines would fall so far short of the truth as to be a lie. All I ask for our boys is belief long and strong enough to carry them to Colorado, California, Alaska, Montana, Nevada, New and old Mexico, for I regard Canada and Mexico as part of one great economic unity—the northern part of this wonderful continent.

Before I pass from the mines I can hardly conceal my purpose to arouse interest in our iron deposits. The story of our wealth in the Messaba, Gogebic, Vermilion, and Menominee ranges reads like romance. Read, if you like romance in real life, the story of Peter White and his connection with the mining world of Marquette and northern Michigan. It is vital with all that is worth reading. What is true of Michigan, Wisconsin, and Minnesota is just as true of Tennessee, Georgia, Alabama, and other southern states, but pre-eminently of those named. And what is true of the states in the North, Michigan, Wisconsin, and Minnesota? This: They gave us the world's supremacy in iron and steel. In those states

the iron is in an oxidized form, and has to be gotten out by means of great steam shovels. These lift the ore, pour it into steel or iron freight cars, and these at times, by gravitation, glide down to the world's largest ore-docks in the world, and pour their contents into 10,000- or 12,000-ton steamers, loading in as many hours now as it took days ten or twenty years ago for boats of 2000 tons. These leviathans of the lakes, loaded with the ore, steam to Buffalo, Toledo, Chicago, Cleveland, and other lake cities, unload into cars that carry the contents to the mighty maws of the roaring furnaces which in a few hours convert the ore into that which is to serve for the watchsprings of Waltham and Elgin, or for the steel bridges of Pittsburg, or the locomotives and steel ships of Philadelphia. Was romance by Dumas or Dickens ever more fascinating than the story of the iron ore as it leaves the forests of the North under the pale light of the sun or stars?—as it leaves furnace or foundry a glowing mass warm with the vital forces and functions of the genius of man?—as it leaves the factory fashioned into the myriad forms of steel and iron? That is a part of the story I have tried to tell.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canada, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the Editor, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JANUARY 1907.

EDITORIAL DEPARTMENT.

A QUESTION OF JOURNALISTIC ETHICS.

It would seem that one styling himself M. Vernon Ponsonby, presumably a British product, has written a "little book" entitled "The Preposterous Yankee," and that the *General Practitioner*, an English medical periodical, has recently reviewed it, or at least that portion of it relating to "The Preposterous American Quack Doctor," and American dentists. We have not seen the book in question, and its existence would probably have escaped our attention had it not been for the fact that the *British Journal of Dental Science* devotes three and one-half of its pages in the issue for October 15, 1906, to republishing the rot uttered by its medical cotemporary in review of the Ponsonby book.

Under ordinary circumstances the self-respecting course of procedure would be to treat such a manifestly dishonest vilification with dignified contempt; but when a dental publication with any pretensions to decency or ethical standing not only admits such a libel to its pages, but voluntarily selects it from another journal and reprints it, the evidence is conclusive that its editor

is in sympathy with the sentiments expressed and as an accessory to their utterance is responsible for their intent and effect.

We omit the major part of the matter and confine our attention to the strictly dental allusions, as follows:

English dentists will read the following with amusement and agreement: "We have heard a great deal in England about the cleverness of American dentists. Some of these dentists come to England; we are sorry, but they do. They paint enormous signs outside their offices and put up huge notice-boards on which copies of the stars and stripes are painted. They then proceed to advertise, boast, and brag. The American dentist is an excellent blacksmith. He knows how to saw, and he knows how to tinker, file, and solder. One of his specialties is to bore holes in sound teeth and then fill them up with gold. He cares very little about his art for art's sake. His business is to yank out teeth at so much a tooth, to put on crowns at so much a crown, and to work wholly and altogether from a standpoint of the journeyman bricklayer or plasterer."

Mr. Ponsonby does not let the dentist rest. Later on he says that an English dentist who was asked to supply a lost tooth for a pug dog would resent the proposition. "He might even administer a punch in the eye to the person who made the suggestion. He would regard it as unprofessional. But the American dentist would grab the dog and fill him full of teeth and vulcanite him in five minutes. In fact he regards it as rather a feather in his cap, because usually he can get a good notice of the event with a picture of his father, mother, wife, deceased mother-in-law, and the house in which he lives, in one of the five-cent Sunday papers. For the same reason he will often bribe an actress to permit him to set a diamond in one of her front teeth."

We are not concerned with M. Vernon Ponsonby, the author, for his utterance of the foregoing, the internal evidence of which indicates pretty clearly that the *motif* of his literary dash for personal notoriety is of the same character as would have made him the typical "preposterous quack doctor" had he elected the medical or dental channel rather than that of writing as the medium for the public display of his talents. What we do object to is that the *British Journal of Dental Science* has dropped from the standards of editorial decency to a plane where such stuff can find a welcome to its pages—stuff that is neither British—thank God!—nor is it Dental Science. No other dental periodical in Great Britain with the exception of the *Edinburgh Dental Student*, an undergraduate paper, has noticed the Ponsonby effusion, and we should be sadly out in our estimate of the status of ethical dental journalism the world over if any reputable periodical should open its pages to such a libel upon the dental profession of any country. Imagine the *Journal of the British Dental Associa-*

tion, or the representative dental journal in any nation, defiling its pages with such matter.

The ways of the quack and impostor are dishonest and obnoxious in any country, and unfortunately, like all the other multitudinous varieties of dishonest humbug, he exists everywhere. He existed in dental form in England even before the discovery of America, and some of those early English specimens were among the first to bring dentistry, such as it was, to the then British Colonies in America. Quackery flourished in England and overran that land before the phrase "American dentistry" was coined, even before there was any material from which it could be coined. The Colonial American papers are filled with the blatant announcements of dental quacks who hailed from England and introduced their methods throughout the newly settled Atlantic coast region, whose inhabitants they fleeced and whose dentures they ruined without let or hindrance for generation after generation. These dental highwaymen were, however, but the overflow which the home competition due to larger numbers drove across the sea in search of a less cultivated field for their irregular practices. So intolerable had English dental quackery become in the land of its origin that it eventuated in that organized effort made by the immortal group of English professional pioneers to overthrow or at least bring under legalized control this disgraceful state of affairs by means of the historic "reform movement" of 1856—just fifty years ago.

Anyone who may be impressed with the idea that dental quackery in England is an American importation will have his views corrected by a study of the records of English writers on the subject, most illuminating of which is the excellent "History of the Dental Reform Movement," by Mr. Alfred Hill. Referring to a period some thirty years previous to 1877, the date of his writing, he states:

It may be safely affirmed that . . . the great bulk of dentists practicing in the United Kingdom, of whom there were some hundreds, were as a class sadly lacking in scientific knowledge. Scattered throughout the cities and towns of our land were to be found those who evidently had no idea of what a profession as such demanded at their hands. Many had entered upon the practice of dentistry as means of obtaining a livelihood only, and had not hesitated to combine with it a trade of some sort or other, in order to secure a larger emolument than dentistry *per se* would bring them. Others again had abandoned their former calling for this one, under the impression

that it was an easy and simple thing to be a dentist. The author has heard of those who had been milkmen, watchmakers, etc., who had no scruple in posting the words "Surgeon Dentist" on their door-plates, in the hope of making passers-by believe they were what they thus professed themselves to be. Advertisements were plentiful, and the most wonderful announcements constantly appeared in the daily press, setting forth the marvelous ability and fascinatingly low fees of these dental magicians. Others, again, openly displayed their tradesmanlike principles by keeping shops for the exhibition of anatomical preparations, casts of mouths, and metal-gilt dentures, and in some cases wrote up their names in decayed teeth. Sober-minded and really respectable men who hoped by honourable effort and proper professional conduct to advance their position, felt it to be a reproach when called by the name of dentist.

This, according to Mr. Hill, was the state of affairs in the period about 1847.

That English dental quackery of the "home-grown" variety was still enjoying a thrifty if obnoxious existence in recent times, notwithstanding the effective work of the reform movement of 1856, is well in evidence by the publication of a book in 1875, reciting in narrative form the methods and characteristics of the English dental quack, under the title of "Vernon Galbray, or the Empiric: The History of a Quack Dentist." Though published anonymously, its authorship was subsequently publicly avowed by Felix Weiss of London. In his preface the author states: "An endeavor to expose the disgraceful frauds practiced on the public by the horde of charlatans who call themselves dentists is the aim of this little book." It is noteworthy that no reference to the American dental quack occurs in Mr. Weiss' book, and that the typical quack taken as the central figure of the story was rather felicitously conceived by the author as originally a Rotterdam Jew, Samuel Levi Moses by name.

From the foregoing and other data to which we have not the space to make reference, we are of opinion that dental quackery is not of American origin, neither is it an American monopoly; further, that in its original form American dental quackery was a British exotic. Indeed, there is fully recorded one of the historic instances of the importation to America of one of the most notorious of these gentry—James Mallan of the Mansion House and Fleet Street, and his subsequent deportation to his native land, as set forth in the *Forceps*, 1844, pages 6 and 36; also *American Journal of Dental Science*, vol. iv, 1843-44, page 71.

But the quack is facile, whatever his nationality or whatever

his department of activity. Quick to seize upon any suggestion or device that will further his nefarious purposes, the dental quack has found that "American dentistry" is a phrase which skilfully utilized in the humbugging of the public will bring to his coffers an increased flow of the coin of the realm; *ergo*, he works the phrase for all the seductiveness there is in it, and consequently, from one end of Europe to the other it is flaunted in the view of the inhabitants and travelers by swindlers who never have crossed their own frontiers, and whose dentistry (?) has about as much claim to an American flavor as has the dope called a Manhattan cocktail sold over the so-called American bars throughout Europe.

We are without statistical data on the point, but it would be really interesting to know how many simon-pure American dental quacks are quacking outside of America; but even though we lack exact information, we are strongly of the opinion that by far the larger proportion of those who so advertise themselves in Europe are native, home-grown, of the ancient, hoary stock who are still working the same old confidence game by the same general methods upon a gullible public—so gullible at times that not a few who ought to know better are willing—together with an exceptional few who are anxious—to believe that they are what they profess to be when they call themselves American dentists.

We presume that the editor of the *British Journal of Dental Science* knows the general facts of the situation. At any rate we assume that it is part of the business of a dental editor to be informed as to the general accuracy or otherwise of the matter which he allows to go to print in his journal. The representative body of the dental profession in England, as in all countries, knows and deplors the demoralizing effect of quackery upon the growth of our profession, and earnest men with the good of dentistry at heart are using every legitimate effort to stamp it out root and branch. But it is the first instance within our knowledge where a reputable dental periodical has given countenance to such a wholly untrue and libelous utterance directed toward a professional body which, while regretfully bearing its full share of the burden of odium which the quacks and professional camp-followers have cast upon it, still points with a pardonable pride

to some of its achievements—not the least of which was the inauguration of those forces that gave the first impulse to the organization and establishment of the profession of dentistry upon a professional basis.

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We have frequently expressed our belief in the importance of a thorough training in chemistry as one of the essentials of the equipment for intelligent dental practice, and we hail with pleasure any earnest effort to improve chemical training in dentistry, either as to its extent or its thoroughness. A knowledge of chemistry is not only at the foundation of all the material and constructive aspects of dental practice, but no one today can have an intelligent understanding of physiology or pathology, not to speak of the complex problems of nutrition—unless he have a good working knowledge of the chemical processes upon which these subjects are based. Teachers

of dental classes have been heretofore largely dependent upon general text-books in their work of instruction, so that the special applications of chemistry to dental needs have been rather imperfectly presented, with the result that chemistry has always been regarded by the majority of students as a task to be performed, rather than as an illumination to the greater part of their professional course. The author of the present work has done a real service to dentistry, by bringing into harmonious relation and compact form the principal applications of chemistry to the needs of the dental student. The field is covered with sufficient fullness, while the details are explicit and are set forth with conciseness and clearness.

Some few instances of obscurity, and a few errors due to oversight will doubtless be eliminated in a later edition. In the preface, for example, "The usual equipment of a *dental* laboratory has been borne in mind," doubtless refers to the chemical laboratory of a dental school. On the same page Essig's "Chemistry" is referred to, instead of Essig's "Metallurgy."

At the beginning of Chapter I, the author states, "In the older books we read of the *noble* metals—those unaffected by heat." We know of no old book that makes such a loose statement,

as it is a well-known fact that all metals are affected by heat, though not all become oxidized when heated. At page 76, it is stated that "A pure phosphoric acid can be made from the ortho- acid by heating till the white fumes begin to come off, then heat to redness, cool, and dissolve in H_2O to a thick syrup." The foregoing is somewhat confusing, no direction being given as to what is to be done between the time the white fumes begin to come off, and the time when one is to begin heating to redness. There is no such thing as H_2O and when the solution is made it will not be "a syrup" but a solution of syrupy consistence.

Oxyphosphate of copper (page 77) is introduced as follows: "A preparation by this name, which has been used to a considerable extent in the vicinity of Boston." Well, we forgive him; the author lives there and consequently can't help it.

A number of interesting plates dealing with the crystallographic phase of micro-chemical analysis are appended to the work, and add much to its value. We heartily commend the book to those engaged in teaching chemistry to dental classes, and to all interested in chemistry as applied to dentistry.

MANUEL DE THERAPEUTIQUE DENTAIRE.
ODONTOTHERAPIE.

MANUAL OF DENTAL THERAPEUTICS.
ODONTOTHERAPY. BY CH. L. QUINCEROT, Chirurgien-dentiste, Officier de l'Instruction Publique, etc. Paris: Vigot Frères, 1905.

Dr. Quincerot's little volume is a clearly worded discussion of the subject of special dental therapeutics. The descriptions of the medicinal agents usually employed in the practice of dentistry are arranged in alphabetical order, and contain innumerable practical and

rational suggestions on the treatment of the disorders most frequently encountered in the practice of dentistry.

In the article on the "Therapeutic Indications that Should Precede Dental Treatment," we find a suggestion the clinical applicability of which will doubtless appeal to every conscientious practitioner. In general, says Dr. Quincerot, in order to render more active, more efficacious the action of topical agents upon the mucous membrane, it will be well whenever possible to have the patient rinse his mouth with, or to apply upon the affected area, by means of cotton wool, the following solution:

Ammonia water,	m. xv;
Chloroform water,	5v;
Boiled or distilled water,	3vij;
Essence of geranium or anise seed,	m. v.

This solution, the author adds, possesses the advantage of freeing the mouth of foreign particles, of rendering the saliva more aqueous, of eliminating the salivary mucus which adheres so strongly, especially in cases of stomatitis, to the surface of the mucous membrane; and of clearing the tongue and all surrounding soft tissues of all extraneous matter.

In the article on Chloral Hydrate we likewise discern several valuable therapeutic hints, which although not altogether novel in character are, however, but seldom made use of by American practitioners. He recommends chloral hydrate in the treatment of pulpitis and pericementitis. In the former condition, after isolating the tooth in the usual manner, a crystal of the hydrate is introduced into the cavity and allowed to deliquesce under a soft temporary filling; while for pericementitis the gum area of the affected region should be brushed with a mixture containing glycerin five parts and chloral hydrate one part.

For the treatment of infected root-canals, and under the heading Chloroform the author recommends the following preparation:

Chloroform,	3j;
Crystallized menthol,	gr. iij.

Dr. Quincerot has used this formula with gratifying results in numerous cases of the kind above alluded to.

The articles Anesthetics, Toxicology, and Dental Formulæ are equally as interesting as any of those already referred to, for throughout these and all of the remaining articles the author has en-

deavored—and well succeeded—to present the results of his clinical experience and that of many other practitioners and investigators of universal renown, in language the clearness of which is justly deserving of commendation. It is regrettable that the usefulness of the little work should of necessity be limited to those conversant with French, the language of the author, for otherwise we should not hesitate to recommend it to all dental practitioners as a useful, practical, and refreshing reminder of the possibilities of rational dental therapeutics.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*l'Odontologie, Paris*, November 15, 1906.]

ERYTHROPHLEIN HYDROCHLORID IN THE TREATMENT OF THE DECIDUOUS TEETH. BY DR. A. AUDY, PROFESSOR AT THE ÉCOLE DENTAIRE, PARIS.

After a long period of experimentation with erythrophlein hydrochlorid in the treatment of hypersensitive dentin in the permanent teeth, Dr. Audy has applied it with gratifying results in the treatment of the pain which usually accompanies the preparation of carious cavities in the deciduous teeth. The application of a minute portion of this agent, sealed by means of gutta-percha in a carious cavity of the second degree, i.e. one involving the enamel and a superficial area of the dentin only, for a period of two days, is generally followed by the complete disappearance of the sensitiveness. Fissure cavities in the molars, as a rule so sensitive as to render practically impossible their being properly prepared for the subsequent insertion of suitable fillings, are made perfectly comfortable

by the aid of the medicament in question. In cavities of the molars involving all of the occlusal surfaces, and usually filled up to the enamel border with softened disorganized dentin of leathery texture, the erythrophlein will avert the pain which generally appears after the removal of the superficial layers. In the case of very large cavities, it is well to apply the erythrophlein by means of a piece of blotting paper slightly smaller than the floor of the cavity, and to seal the paper dressing with a small layer of gutta-percha.

The application of this agent in cavities of the deciduous teeth is at no time followed by pain or uneasiness, but when introduced into cavities of the permanent teeth, it usually causes a marked uneasiness—impossible to localize—on the same side of the jaw as the affected teeth. In cavities involving the pulp-chamber and requiring the extirpation of the pulp, Dr. Audy proceeds as follows: At the first sitting he removes as much of the carious dentin as possible, and as soon as the pain

becomes at all severe, he applies a dressing of erythrophlein. A day or two afterward, when all possible hyperemic phenomena have been relieved, he makes a minute arsenical application, which, owing to the depleted condition of the pulp, causes none of the unpleasant symptoms which would otherwise follow such devitalizing dressings. At a subsequent sitting the pulp can be extirpated either *en masse* or in smaller particles. In the latter event, the mechanical treatment should be followed by a dressing of geranium-formol. A few days afterward if no unfavorable symptom has developed, the tooth may be filled "permanently."

The author after describing in detail several cases in which the application of erythrophlein had, as aforesaid, materially hastened and facilitated the treatment, concludes his communication, reviewing the clinical advantages possessed by the agent, and warning his readers not to employ it in direct contact with the pulp, inasmuch as it acts favorably only in those cases in which the pulp is but partially exposed, and is still fairly well protected by a layer of disorganized dentin of varying thickness.

From a previous article on the subject by Dr. Audy, the reviewer quotes as follows regarding the characteristics of erythrophlein hydrochlorid: "Erythrophlein is an alkaloid extracted from the bark of the African tree, the *Erythrophloeum Guineense* (sassy bark, mancona bark). It is an extremely toxic substance with selective influence upon the heart. Injected under the skin of a frog's leg in 2 mgm. doses, it brings about inside of five to eight minutes the complete arrest of the cardiac contractions. The ventricles are the first to stop—the arrest occurring during systole; the auricles soon follow, their cessation of function taking place in diastole. The paralysis of the cardiac muscle is followed shortly after by progressive resolution, death occurring at this time. In the warm-blooded animals, the alkaloid produces convulsions and dyspnea, consecutive to the blood-changes it induces. Post-mortem examination shows the heart soft and filled with blood, and traces of the alkaloid in the bloodvessels. Atropin does not stimulate a heart paralyzed by erythrophlein. Curare retards the effects of the alkaloid."

The United States Dispensatory (17th edi-

tion) refers to the anesthetic power of erythrophlein, stating that "In 1888 Dr. L. Lewin asserted it to be a powerful local anesthetic, whose action is more pronounced than that of cocain. His paper gave rise to an extraordinary controversy, Professor Liebreich of Berlin and Dr. Tweedy (London *Lancet*, 1888), denying the existence of the anesthetic power. Schoeler, Karciok, Goldschmidt, Lipp, and others have, however, noticed a local anesthetic influence, and it would appear that the alkaloid has the property attributed to it. A solution of the strength of one-tenth of one per cent. has been used as an application to the cornea. It must be remembered, however, that the alkaloid is violently poisonous." For additional information on the subject, the reader is referred to the writings of Professor Lipp, and to those of Professor Germain Sée in *La Medecine Moderne* for December 1891.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zürich, July 1906.]

TREATMENT OF ACUTE AND CHRONIC SUPPURATIONS WITH CARBOLIC ACID IN COMBINATION WITH GUM CAMPHOR. BY DR. C. EHRLICH, BERLIN, GERMANY.

The author (*Semaine Médicale*), following in the footsteps of Dr. Chlumsky, has carried on a series of investigations in view of determining the antiseptic power of mixtures of carbolic acid and camphor. During the last quarter of the year 1905, the author tested the mixture in a number of cases of whitlow, phlegmon, ulcers of the lower limbs, fissure of the anus, furuncles, erysipelas, tuberculous fistulæ, and infected wounds of all varieties. By comparing the results obtained with the carbolic acid-camphor mixture with those obtained in similar cases with the antiseptic agents ordinarily employed, Dr. Ehrlich has convinced himself of the fact that applications of carbolic acid-camphor mixtures are more efficacious than dressings with any of the ordinary agents employed for the purpose, and particularly so in cases of acute suppuration. All the whitlow cases, which otherwise require from eighteen to nineteen days to reach the stage of absolute cure, healed satisfactorily under the influence of the mixture under consideration in about six days; and ordinary phlegmons in four days on an average, as

against eight days under the usual mode of treatment. Dr. Ehrlich employs a mixture of pure carbolic acid one ounce, alcohol two and a half drams, and camphor two ounces. This mixture differs from that suggested by Dr. Chlumsky in the presence of the alcohol, as the latter's formula is composed exclusively of carbolic acid and camphor. In the application of the carbolic acid-camphor mixture to the treatment of superficial ulcerations and infections, care should be exercised not to employ any form of impermeable dressing material.

[*Tribune Médicale*, Paris, June 5, 1906.]

ON CERTAIN DENTAL DISORDERS
CAUSED BY A DIET EXCLUSIVELY
LACTEAL. By Dr. W. B. PIETKIEWICZ.

Adherence to a milk diet may reflect itself unfavorably upon the teeth proper, and likewise upon the alveolar periosteum and the pericementum. It may induce caries, arthritis, periostitis, and pyorrhea alveolaris. These disorders are often overlooked by the attending physician; but among hospital patients they are less frequently disregarded, inasmuch as in the latter they assume more serious proportions owing to the lack of suitable hygienic care usually observable among such patients. Following the beginning of a milk diet, and often as early as the second or third day, the patient experiences, especially upon taking cold or hot drinks into the mouth or upon inhaling cold air, a very painful sensation in the majority of the lower teeth. This sensation is particularly severe in the necks of the teeth. If the patient should have carious, but painless teeth, they become painful soon after the introduction of the milk diet, the caries progressing without interruption. In addition to the existence of caries in the necks of teeth of a patient on a milk diet, such a course of treatment is likewise responsible for the production of numerous occlusal cavities. Such disorders as arthritis, pyorrhea alveolaris, and alveolo-dental periostitis (pericementitis) are additional dental manifestations of a milk diet occurring with the same frequency as caries. The former also appear a few days after the beginning of the milk diet, and are often practically overlooked, as in the majority of cases they are markedly sensitive only to extreme ther-

mal stimulation, a condition not occurring during the period of milk dieting. It often happens that one or more teeth become loosened, in which event, if proper treatment be not instituted, their total loss will follow soon afterward.

It seems useless to enter into a discussion of the pathogenesis of the disturbances under consideration. Suffice it to say that in addition to the fermentation of the stagnated milk in the mouth causing a disintegration of the hard elements of the tooth, an insufficient degree of vital resistance—usually the case in patients requiring a milk diet—and lack of masticatory exercise are important factors in bringing about the above described pathological phenomena.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zürich, July 1906.]

AN INTERESTING CASE OF FRACTURE
OF THE MANDIBLE. BY PROF. E.
MÉTRAL, OF THE ÉCOLE DENTAIRE OF
GENEVA, SWITZERLAND.

The author reports a case of fracture of the mandible presenting unusually interesting features. The case was that of a lady aged fifty-five, who, as the result of a serious automobile accident, had sustained a fracture of two ribs, two fingers, and of the mandible between the right second premolar and the right first molar. Examination of the mouth was with difficulty carried out, owing to the extensive and voluminous tumefaction of the surrounding soft tissue areas. The gum was torn and lacerated over an area of several millimeters, and the second bicuspid was loose and slightly out of its alveolus. The line of fracture was oblique from above downward and from behind forward. All such characteristic symptoms as crepitation, mobility, lowering of the anterior fragment, and elevation of the posterior fragment were present. During the process of reduction the patient suffered almost unbearable, excruciating pain, but notwithstanding the severity of the local symptoms, no general manifestation was detectable. After having obtained suitable impressions of the maxilla and the mandible, and plaster casts therefrom, it was decided by the author to support the fractured organ by means of a gold splint, which was made to accurately embrace all the surfaces of the fourteen teeth in the fractured jaw, and to

fit the occluding surfaces of the thirteen maxillary teeth. The splint was held in position by means of six small screws, which running through the buccal surface of the splint, would engage themselves in the interproximal spaces, and thus hold the splint immovable *in situ*. The splint was in addition suitably perforated at numerous places to permit of the entire affected area being antiseptically treated at frequent intervals. The insertion of the apparatus was accompanied by most severe pain, but on the following day a marked improvement was already noticeable, the patient being then able to take solid food and to enunciate without difficulty.

Throughout the treatment the author kept the mouth in as thoroughly an antiseptic condition as possible by means of irrigations with ten-volume hydrogen-dioxid solution every four hours. A slight suppuration occurred in the lacerated gingival region, and shortly afterward a small sequestrum was eliminated.

The strikingly interesting point about the case under consideration lies in the fact that, notwithstanding the age of the patient, complete consolidation had taken place on the nineteenth day after the accident, at which time it was found that the lacerated—and at first highly inflamed—soft tissues had entirely regained their normal appearance and function; that the teeth were as clean as if they had been brushed daily, and that the articulation had suffered no modification whatever. In concluding, the author remarks that for the treatment of cases demanding the insertion of the metallic splint, 20-k. gold is the material *par excellence* from which to swage the apparatus.

[*Trans. Odontological Society of Gt. Britain*,
June 1906.]

SOME NOTES ON THE RELATION OF
DENTAL CONDITIONS TO PULMONARY
TUBERCULOSIS. BY F. LAWSON DODD,
M.R.C.S., L.R.C.P., L.D.S., D.P.H.

The writer of this communication, because of his connection with the staff of the Metropolitan Hospital for Diseases of the Chest, with its sanatorium for the open-air treatment of phthisis, was led to examine the possible relationship of the general disease tuberculosis with the local conditions obtaining in the mouth of the patient. He calls attention to the fact that increased knowledge

of pathology, and especially of bacteriology, is leading the medical profession to place an increasing significance upon the condition of the mouth as a factor both in the production and prevention of disease.

He refers in general terms to the modern treatment of pulmonary tuberculosis, which consists mainly in the removal of the patient from an unhealthy environment and placing him in such conditions as will favor success in the struggle against disease. The avoidance of all possible sources of infection is achieved by placing the patient in a germ-free atmosphere and keeping his surroundings scrupulously clean. Meanwhile the nutrition of the body is maintained, or aimed at—often unsuccessfully, for reasons to be specifically referred to later—by a plentiful food supply added to as large a measure as possible of physiological rest.

The writer believes that investigation from the standpoint of the dental surgeon will show that a large proportion of the modern treatment of consumption is but a cleansing of the outside of the cup and platter, a system of removing some of the more remote obstacles to progress, while the more intimate and personal dangers are entirely overlooked. He refers to the broad generalization that the human mouth is a perfect breeding-ground for pathogenic organisms, adapted alike by temperature, moisture, and the presence of an endless supply of nutrient material—conditions which make possible the growth and development of a flora of micro-organisms that is extraordinary in its number and variety—a generalization made possible by the researches of Miller of Berlin, Goadby of London, and others. Though Koch's bacillus (apart from its presence in actual sputum from the lungs) is comparatively rarely found—a fact due mainly to its weakness in the struggle for existence against endless foes—the bacterial flora of the mouth contains pathogenic as well as non-pathogenic organisms. In apparently healthy persons the pneumococcus, the micrococcus tetragenus, staphylococcus and streptococcus pyogenes, and the Klebs-Löffler bacillus have all been found. These organisms may all gain entrance to the system by inhalation, swallowing, through abrasions or wounds of the tissue of the mouth, or through exposed and necrosed tooth-pulps. It is not claimed that hygienic care of the mouth will remove all, even of these or-

ganisms, but it will greatly lessen their number, and with that the chances of infection. But whatever may be said in regard to the specific septic infection taking place through the mouth and teeth, there is no doubt as to the existence of secondary anemia, associated with lowered vitality and great foulness of the whole alimentary tract, resulting directly from buccal infection. In such cases not only is there local absorption of toxins from the mucous membrane of the mouth and the alveoli of the teeth, but the infection with staphylococci is a continuous process throughout the alimentary canal. Just as the remedy for chlorosis was said to consist in the cleansing of the lower end of the intestine, so we may claim that the cleansing of the mouth is of equal importance. It is a safe aphorism, Look after the two ends of the alimentary canal, and the middle will look after itself.

He shows by statistical figures that the part played by oral sepsis in the production of phthisis in adults may be repeated with greater emphasis in the case of children. They are more susceptible to diseases of the respiratory organs, and to tuberculosis in particular. And while his observations pointed toward the belief in the simultaneous existence of carious teeth and exposed pulps in the cases of children admitted to the institutions with which he is connected, he states that while we can only draw inferences from such facts, they are sufficient to bring out the importance of removing every possible cause of disease.

The author is more emphatic in asserting the potency of mouth-breathing as a common contributory cause of phthisis. The habit of mouth-breathing in many cases being either a result of carious teeth in early life. An exposed pulp or tender septic gums rendering mastication impossible, the child is afraid to close the jaws, and not only acquires the habit of bolting his food, but also, to avoid possible painful contact with the teeth, keeps them open sufficiently to part the lips, and begins to breathe from the aperture thus formed, while the part played by oral sepsis in enlarging the tonsils will itself favor this dangerous habit. We may reasonably say that whatever influence oral sepsis may have in the production of phthisis, the first aim in its treatment should be the reduction of infective processes and the inculcation in the

patient of the importance of scrupulous cleanliness of the mouth.

The author emphasizes the second factor in the treatment of phthisis, namely, the proper nourishment of the tissues, and calls attention to the important researches carried out in America by Mr. Horace Fletcher on the question of oral digestion and its relation to health and disease. The intimate connection shown to exist between mastication and nutrition emphasizes the importance of carefully considering the condition of the teeth in cases of phthisis.

The nutritional treatment of phthisis must depend upon two factors: (1) The presence of appetite, and (2) the power to assimilate the food taken. Septic mouths, coated tongues, local suppuration of the gums, pyorrhea alveolaris, suppurative periodontitis, all destroy the desire for food by their effect on the mucous membrane of the tongue and fauces, chiefly by impairing taste, but also by infection of the stomach and intestine. In combating these cases of anorexia, attention to the teeth and mouth is all-important.

According to Miller it is erroneous to imagine that organisms bred in the mouth necessarily perish in the stomach. It is certain that normal gastric juice does not destroy the virulence of the tubercle bacillus when swallowed by careless or weak patients with the sputum.

He quotes from Miller ("Micro-organisms of the Human Mouth," page 303) the statement that "In a very unclean mouth examined for this purpose I estimated by culture methods the number of cultural bacteria at 1,140,000,000. Many of these were doubtless carried to the stomach during every meal, to be replaced by others developing between meals and over night." In a well-managed sanatorium an aseptic food supply may have been attained—even the milk consumed may be free from tubercle bacilli; but all these precautions may be a delusion and a snare if the patient, before swallowing his food, is chewing it in such a charnel-house as described in the above words, which unquestionably depict a very common state of things. It is waste of public money to increase the diet in such cases without at the same time insisting on conditions of oral cleanliness among those undergoing the open-air treatment for consumption. It is better in many cases freely to remove diseased teeth than to

leave them in the condition in which one finds them in the mouths of a considerable proportion of our patients.

It is necessary to see to it that patients possess the power to assimilate the food given. The loss of masticating power, with or without the habit of bolting the food, is a serious handicap to the phthisical patient; therefore an important part of the treatment must consist in replacing lost teeth. Where this is not practicable it is well to remember that with soft food much may be done by working it between the tongue and hard palate, so as to thoroughly incorporate it with saliva and give time for oral digestion. This can only be done safely where oral hygiene is duly attended to.

The author quotes a number of authorities and presents statistics to show the relationship between chronic lymphadenitis and diseased teeth, and says that such cases at least warn us of the possibility of serious general infection, breaking through the lymphatic barriers, already lowered in resisting power by repeated attacks or the commoner products of oral bacteria; and it should not be forgotten that the study of the relation between oral sepsis and general disease is at present in its infancy, as is proved by the obscurity that still hangs around the etiology of cervical lymphadenitis.

He does not pretend to say that the evidence for general infection with tubercle through carious teeth is either satisfactory or complete, yet the danger of oral neglect is made at least more serious by the records. The writer calls attention to the possible danger of secondary local infection in cases of pulmonary tuberculosis, and presents statistics from Zandy of thirty-seven cases of alveolar tuberculosis in which infection spread directly in three cases of lupus. In the majority of the remainder the buccal mucosa was first attacked, the condition spreading to the gums and teeth later. In five of the thirty-seven cases tubercular ulcer commenced at the seat of extraction of the teeth. Zandy agrees with Starck that caries of the jaw may result from infec-

tion between teeth and gums, or through the pulp of a carious tooth.

After reporting a number of illustrative cases, the writer says: "I hope to have at least established the claim that our position as dental surgeons is important in connection with the treatment as well as the prevention of tubercular infection, both local and general. It is for us to maintain that all the expensive schemes for the open-air treatment of pulmonary tuberculosis are largely handicapped unless radical measures be taken to render clean and efficient the mouths of the patients admitted. Surgical cleanliness of the mouth and teeth may be reached by proper operative treatment, but this alone is useless unless a rule of cleanliness with regard to the brushing of the teeth and gums be insisted upon, and its execution supervised. Observation has confirmed this necessity."

The points of his communication, as summarized, consist of the following:

(1) Septic conditions of the mouth favor the occurrence of tubercular infection by lowering the vitality and power of resistance, both generally and also locally in the case of the lymphatic glands of the neck.

(2) Dental caries, especially when associated with exposed pulps, may open up channels for direct infection of either bony or soft tissues of the mouth, and either primarily or secondarily.

(3) Neglected mouths may sometimes confuse the diagnosis in cases of incipient phthisis.

(4) In the open-air treatment of consumption, the care of the teeth and mouth generally should be regarded as one of the most important factors making for success.

(5) Costly buildings and great institutions are springing up all over the country, and it is certain that so long as the mouths of the patients are neglected in the present manner, the money of the public is being largely wasted and the percentage of recoveries considerably lessened and delayed for want of proper dental supervision and care.

PERISCOPE.

To Polish Plates.—Use powdered pumice stone moistened with Johnson's ethereal soap, employing either felt cones or brush wheel. It is cleaner than when water is used to moisten the pumice, and will save time.—E. T. EVANS, *Dental Review*.

Cementing Arsenic.—Mix the cement rather thin and place a small drop of it on a bit of paper and carry the paper to the cavity with the pliers; then press to place with a burnisher. The paper facilitates adjustment to place and prevents the cement adhering to the instrument.—C. B. WARNER, *Tri-State Quarterly*.

Sterilization of Dentures.—Sulfurous acid will absolutely deodorize and disinfect a denture, and not merely cover the odor of a plate that has been worn in the mouth. Place a few drops in a little water and immerse the case in the solution at night and cleanse with soap and brush in the morning.—J. KENNERLY, *British Dental Journal*.

Cleaning Files.—When a vulcanite file becomes clogged with rubber and plaster, it may be easily cleaned by wrapping absorbent cotton around it and subsequently saturating the cotton with chloroform. In about ten minutes it can be cleaned perfectly by the use of a stiff brush wheel on the lathe.—V. P. PERISHO, *Dental Review*.

Protecting Porcelain Surfaces for Solder Work.—If porcelain surfaces in bridge work are coated with sandarac varnish before investing, and care is taken to have the investment thoroughly heated before beginning soldering, it will result in little or no cracking or checking of the porcelain.—HENRY C. LEE, *Dental Review*.

Treating an Alveolar Abscess Through the Alveolar Process.—I believe it is a mistake to carry a tooth along through weeks and weeks of treatment through the pulp-chamber, and many of us make a mistake in treating teeth too often. Whenever an abscess forms about a root, it nearly always surrounds the apex of the root. It destroys the peridental membrane around the sides of the

root, consequently treatment through the root-canal does not effect our purposes, and after pus has been present some time, if the surface of the root has been bathed in pus for many weeks, we will get satisfactory results from treatment through the pulp-chamber in very few cases. I do not practice immediate root-filling in such cases, but I have done it "more immediately" than is the general custom. In such cases I prefer to fill the root-canal, and, if necessary, make an opening through the alveolar process.—ARTHUR D. BLACK, *Dental Review*.

Method of Inserting Crystal Gold in Combination with Foil Gold.—How many dentists in using crystal golds have taken advantage of the ease of adaptability of some of these forms of crystal gold to a cavity by using them in connection with foil or heavy gold, placing a mass of crystal gold relatively in position, and over it a mat of foil or plate of rolled gold to facilitate the carrying of the crystal accurately to place *en masse* without the chopping up that is apt to occur in my hands with any form of crystal gold? It seems to me there is a saving of time and of gold, and facilitation of the packing, by using alternate layers of crystal gold and foil in some form, combining in this way the virtues of foil and crystal. —W. V-B. AMES, *Dental Review*.

Practical Thoughts on Impression-Taking.—While modeling compound at the time of its advent was hailed as a substance of marked value for the taking of impressions, and while it is still in favor for many prosthetic purposes, experience has proved that it cannot be used to advantage where great accuracy in reproduction is necessary, as in the making of either entire or large partial dentures. Plaster of Paris either alone or in combination has entirely superseded all plastic materials, and no rival to it has appeared. In the manner of working it and bringing out the best qualities, experience has developed several improvements.

Where sodium chlorid was formerly employed to hasten the setting of ordinary or slow-setting plaster for impressions, it is now recognized that the best results are obtained by using the quick-setting variety without the

addition of any chemical. While the combination of a wax or modeling compound base and a top layer of plaster was once much in favor, the difficulty of accurately replacing broken portions of the impression has greatly lessened its employment. The placing of a wax guard along the posterior border of the tray, however, is one of those minor devices which has proved to be of the greatest value; not so much for the purpose of preventing the plaster from extending too far back upon the palate, for which it was first suggested, as for the compression of the soft tissues at a point where the plate terminates. Experience has demonstrated that plates made from such impressions are best adapted for the exclusion of air at this vital point.—S. H. GUILFORD, *Stomatologist*.

Devitalizing Pulp.—Arsenic, if properly sealed in a cavity and left long enough, is much more satisfactory than pressure anesthesia to both the patient and operator, unless the case be one of emergency, and then no doubt pressure anesthesia is the method to use. We were taught in college to leave arsenic in a tooth from twenty-four to thirty-six hours only. I am quite convinced that allowing such a limited time for the arsenic to do its work is the reason so many young practitioners are sorely tried by having patients return too soon, and upon opening into a tooth, find the pulp still vital or partially so.—W. E. O'KEEFE, *Dental Review*.

The Mixing of Amalgam.—I have much fault to find with the prevailing method of amalgamating alloys. If we are to start out with a homogeneous alloy, we should wind up with a homogeneous amalgam. The very best grades of modern alloys do not combine readily with mercury, and even after the combination of the metals has been effected there remains within the mass a large surplus of mercury, including a fair percentage of particles of alloy which have not succumbed to the action of the mercury. During the process of wafering the amalgam, also including its insertion in the cavity, there remains in the amalgamated mass a large percentage of free mercury, together with a lesser proportion of unamalgamated alloy; and so in time two evils are bound to develop in the way of shrinkage and lack of permanence of form. The shrinkage is due to the surplus of mercury, while the slight change of form is the result of particles of alloy acting upon the free mercury, thus causing a change in the crystalline structure of the amalgam. The only remedy we have for such trouble is to spend more time in mixing the alloy; such as

tritulating it with a faint surplus of mercury and removing the surplus of that metal by using gentle pressure. Return the mass to the mortar or the palm of the hand and work it vigorously until it has re-softened. Wafer again, and continue the kneading and wafering process until, all told, four operations have been performed. You will be surprised to find how much more mercury will be removed from the mass when working your alloy in this manner. You will also succeed in producing a homogeneous amalgam, with the exception of a certain percentage of free mercury that can only be removed as the amalgam is inserted in the cavity. When the mass of amalgam is large the final wafering process should be performed by dividing it into several portions and wafering each one separately.

The success attained in producing a good mix does not depend upon the amount of mercury that you use as much as upon the amount that you succeed in removing from the mass.—N. K. GARHART, *Dental Era*.

Prevention of Air-Spaces in Vulcanized Rubber.—The expansion of rubber by heat between 200° and 320° is a very close approximation to its shrinkage, therefore, if, after the flask is closed by boiling it, the bolts are slackened so that the flask will part easily under the pressure caused by the expansion of the rubber as it is heated to the vulcanizing point, all the rubber which was in the mold when it was closed can be retained therein. Then, if spring pressure be applied, and the flask closed after shrinkage has practically ceased, the rubber will, at the end of the vulcanizing process, remain closely applied to the teeth and the surfaces of the mold.—GEO. B. SNOW, *Dental Brief*.

Removal of a Broken Gates-Glidden Drill.—Many are lucky enough never to break a Gates-Glidden drill only where they are intended to break—up near the shank. Not long ago, in cleaning out an upper lateral, my Gates-Glidden drill broke off, leaving about a quarter of an inch of drill in the tooth. After failing to get it out by the use of pliers, etc., I stepped over to the stock room of a telephone company and borrowing a large horseshoe magnet, magnetized another Gates-Glidden drill by allowing the drill to rest on the magnet for a short time; placed the drill alongside the piece still in the tooth, worked the one thus magnetized around in the tooth to be sure there was a good contact; removed the Gates-Glidden and the broken piece came out with the magnetized drill.—DEWEY D. SMITH, *Dental Summary*.

Perhydrol (Hydrogen Dioxid) in Dental Hyperesthesia.—Viggo Andresen of Copenhagen (*Deut. Monatsschrift für Zahnheilkunde*, January 1905), states that a few drops of the 30 per cent. hydrogen dioxid (perhydrol) of Merck acts almost instantaneously in anesthetizing the dentin. It is to be preferred to silver nitrate, since it bleaches instead of staining. In filing off long teeth much pain can be avoided, but for the pulp itself the drug is entirely too irritating. In cavities that cannot be kept dry, it also serves to disinfect, while the cauterization is too short in duration to be harmful.—S. H. GUILFORD, *Stomatologist*.

Bent-Wire Clasps.—The greatest improvement in clasps as plate supporters consists in forming them of round or half-round platinum gold wire, bent upon itself, or doubled and so shaped as to include in its grasp as much of the circumference of the tooth as clasps usually do. This open or bent-wire clasp, by its form, possesses the peculiar advantage of having one of its folds just above the greatest diameter of the crown, and the other just below it. By this means the tooth is not only more firmly grasped, but the clasp by virtue of its shape can neither slip up toward the gum nor down toward the occlusal surface. This form of clasp is far more correct in principle than the former kind, where the flat surface of the clasp, in contact with the convex surface of the tooth, was intended to afford the desired resistance.—S. H. GUILFORD, *Stomatologist*.

Hard Mucous Surfaces: How to Modify them in the Impression.—In a former paper I referred at length to certain difficulties which often occurred in the fitting of artificial teeth, owing to the unequal conditions of the mucous surface of the mouth. We will suppose that we have before us an edentulous mouth, hard and bony in the central line of the palate, while the sides and alveolar ridge are soft and compressible. It will be found that a case perfectly fitted to this mouth would, under pressure of mastication, bear first—and unduly—on the surface which is hardest, viz, the bony ridge, with the result that it would rock, cause pain, and fail in suction. My manner of procedure is as follows: First examine carefully the mouth. Note the extent of the hardness as compared with the surrounding parts, then take a sheet of absorbent fiber lint paper, such as we use for drying out cavities, and which consists of about four distinct layers. Cut out with sharp scissors a piece resembling in shape the hard surface, strip the

paper to the desired thickness, and place over the bony surface. Immediately deposit upon this a small piece of softened compound, about the size of a button, and press into position. The floor of the roof being thus covered the model must be completed in the usual way. On withdrawal, it will be found that the "paper" will be enveloped in the substance of the modeling compound. Before pouring the model with plaster, wash out the paper. When the model is poured it will be seen that over the hard and bony part of the mouth is a raised surface, which in the finished denture acts, to some extent, as a suction cavity, but which absolutely prevents undue bearing and rocking on the bony surface, and results in a general distribution of the pressure of mastication on all parts of the mucous surface.—J. C. OLIVER, *British Dental Journal*.

Methods of Diagnosis: The Exploring Needle and the X Ray.—The exploring needle in the hands of a skilful dental surgeon whose touch has been "educated" locates hidden roots, abscess cavities, necrotic tissues, and phagedenic destruction of bone. Its revelations are swifter and surer, under some conditions, than those of the X ray.

In locating misplaced and unerupted third molars the X-ray method is unequaled. But there are comparatively few dental surgeons provided with the facilities or equipped with the skill and training in the art of skiagraph pictures necessary for formulating an accurate diagnosis by this means. No one will dispute the value of this insight into the hidden things of nature; and when all other means have failed to give the operator a fairly clear mental picture of the case, before proceeding we should resort to this, even if it should be necessary to call in the aid of a specialist in the work.—L. G. NOEL, *American Journal*.

The Therapeutic Value of Mastication. It has long been recognized that the oral cavity constitutes an important factor in the physiology of digestion, and this importance is increased by the knowledge—now so universally prevalent—that many chronic diseases are directly dependent upon auto-intoxication originating in the intestinal tract. The part which the mouth and its accessory structures play in digestion is in fact of equal value with that assumed by the remaining portions of the alimentary canal, and this is of particular significance, because it is here that the only part of the process resides which is under voluntary control. The oral cavity is concerned with the mechanical disintegration of the food, it regulates the temperature of the latter, and provides an admixture of sa-

liva which, aside from its lubricating function, affords a means by which the organs of taste are excited and the digestion of the carbohydrates begun. Pavloff has pointed out that the sensation of palatability conveyed by this means has an important psychical effect on the secretion of the gastric juice, and in addition, the peripheral stimulation of the gustatory nerve increases the potential energy of the entire nervous system. Montlouis and Pascault (*Journ. des Praticiens*, No. 3, 1906), following Fletcher and Chittenden in their modification of Cornaro's practice, believe that this knowledge can be made of great practical value in the treatment of certain diseased conditions. Thorough mastication, it is quite evident, will serve to make even small quantities of food more efficient and sustaining. In addition to this, the assimilation of otherwise indigestible material is favored, and the remaining portions of the alimentary tract are relieved of a certain amount of labor. Systematic mastication, therefore, they regard as of particular value in dyspepsia and auto-intoxication; arthritis and neurasthenias of various types, which are believed to depend on the latter, will consequently be especially benefited. Even when the diet is limited to fluids, the suggestion also holds good in a way, for in this case it is advised that the nutriment be taken in small quantities at a time, in order to gain the same advantages in the way of gradual introduction into the stomach and mixture with saliva which would otherwise be produced by the act of chewing.—*Med. Record*.

How to Take an Impression of a Soft and Flabby Mouth.—In some cases the arch is soft and flabby, and in some the ridge, if not gone, is soft and yielding; in extreme cases no bony parts exist at all. In such instances it is a question of science to construct such a denture as shall be useful and of some comfort to the wearer. If we make a plate over the parts as they are, it will fit only so long as we do not use it. But the moment we try to masticate, and the pressure necessary for that function is applied, it will necessarily dislodge the plate. Here plaster is contra-indicated as a material for impressions; and the softer the mouth the more it is unfit for the work. We do not want an impression of the tissues as they are, but as they would be after pressure upon them is applied. Many of our patients in this class of cases will tell us, "Doctor, the plate stays in place until I start to eat, and then it comes down;" whereas if you had considered that the soft tissue is subjected to considerable pressure in the act of eating, in order to make the plate stable you would have had it fit when

the tissue was compressed. My plan for taking impressions of mouths extremely soft is to take the best possible impression in modeling compound, then chill it until set, and trim out the entire surface to a depth of about one-eighth of an inch. Then warm up and soften more compound, and spread it evenly over that already in the tray. I usually select S. S. White compound to get the first impression, as it takes a little higher temperature to soften it, and it does not become quite so plastic. Then for the second batch I employ a quick-setting, lower-temperature compound, as the Detroit, or some other similar make. When this is put in for a final impression it should be quickly handled, not to chill in manipulating or to heat up the first compound used. It will take some pressure to secure the impression, as the tray and the first compound used will act as a matrix to hold together and confine the second and softer preparation; force it well against the tissue, taking advantage of all the compressibility of the tissue possible. Plaster in these cases does not fill the bill, for if we exerted enough force to compress the tissue it would be pressed out of the tray, and parts of the mouth would be in contact with the tray.—E. M. KERRIG, *Dentist's Magazine*.

Pulmonary Abscess Caused by a Tooth.

—A. C., a young lady who consulted me, stated that she had been ill for about seven months. She complained of pain located in the right side of the chest, together with severe cough and profuse expectoration. Her previous health had been very good. About seven months previously she began to cough. This was accompanied with pain in the right side of the chest, and soon afterward with expectoration of thick phlegm. She had difficulty in breathing. These symptoms increased in severity, and the patient lost a great deal in weight. She consulted several medical men, and was treated at the Swansea Hospital as a case of phthisis pulmonalis. Her condition did not improve. When I saw her, she appeared very ill, and was quite unable to leave her bed; perspired freely, and was much emaciated. Her temperature continued at 101°. The cough was very troublesome, and accompanied with expectoration of fetid pus. The movements on the right side of the chest were very much diminished. Vocal fremitus was diminished on the right side of the sternum. There was extensive dullness from the right clavicle to the fourth rib. The apex beat of the heart was displaced downward and to the left about 1½ in. There was undoubtedly an abscess in the lung. Three days after I first saw the patient she had a very violent fit of coughing, with a discharge of a

large quantity of pus from the lungs. On examination of this there was found a second bicuspid which she had had extracted by a dentist about seven months previously. This tooth must, of course, have been drawn into the glottis while she was under gas—although she was quite unaware of the fact—and lodged in one of the divisions of the right bronchus, where it caused the formation of a large abscess.

After this the patient made an uninterrupted recovery. The lung was healed up. Owing to the contraction of the lung, the heart has been drawn considerably to the right side, the apex being at least one-half inch to right of normal.

It was undoubtedly a very lucky chance which led to the expulsion of the tooth from a large cavity through what must have been a small opening, but this must have been due to the tooth being carried in the current of the thick, purulent contents of the cavity toward this small opening.—JOHN D. DAVIES, *Brit. Med. Journal*.

Treatment of Sensitive Cavities: Carbolic Acid—Sodium Dioxid.—There was a discussion at the August meeting of the American Dental Society of Europe on this subject, in which Dr. Bogue of New York, told us he used pure carbolic acid first in the cavity and afterward zinc chlorid. I have been experimenting for some months with sodium dioxid, and now, having utilized Dr. Bogue's hint about using carbolic acid first, I find I can control very troublesome cases with not too much previous pain. For three or four years I have used very finely powdered sodium dioxid for relieving sensitive places on the necks of teeth, or spots rendered sensitive by contact with gold bands supporting plates. This led me to use it occasionally for troublesome cavities. My present method is: Flood the cavity with pure carbolic acid, and wait a minute or so; then, without wiping out the acid, put into the cavity a little finely powdered sodium dioxid. This causes some pain. Add a few more grains, and commence to carefully excavate. If the rubber dam is not used, care must be taken of the gum.—HENRY I. MOORE, *Dental Review*.

How to Determine the Direction of the Condyle's Path.—To find what is the direction of the condyle's path in a patient, the dentist may proceed thus: Having taken the articulating impression in the usual way—this method cannot be used with the squash bite, unless in connection with the true-bite plates—and before removing it from the mouth, let him ask the patient to protrude the mandible as far as possible—which will

be about a half inch—and then to close it again. If the patient's condyle path inclines downward the two planes of wax will now meet only in front, but if it is horizontal they will remain in full occlusion with each other. If the former, the amount of their opening at the molar region may be determined by inserting a knife-blade or small stick of wood, marking its position—also marking the extent of protrusion—so that when the articulating impression is transferred to the articulators, and a similar protrusion is made on them and the knife-blade or stick is inserted in the same place, it can be readily seen if the articulator's mechanism representing the condyle's path needs adjusting to suit the case.—STEWART J. SPENCE, *Dentist's Magazine*.

Methods and Equipment for Bedside Dental Treatment.—It is my practice to make clinical visits either early in the morning, at the noon hour, or in the afternoon after regular office hours. There are times, however, when the case is being seen in consultation; in that event the hour must be arranged with the physician or consultant. My assistant accompanies me, being even more useful there than in the office in setting up the dental engine, arranging the instruments, and assisting in the treatment. Regarding the apparatus: It consists essentially of a physician's operating bag carrying a modified dental engine, operating instruments, and mouth-illuminating apparatus. The instrument case is one known as the half-cabin physician's bag, about 17 inches long and 6 inches wide. The lower portion is removable, and contains instruments, trays, and a complete set of half-ounce glass-stoppered medication bottles, while the upper portion carries the engine, illuminating apparatus, and other larger objects. The portable dental engine is a most important part of the equipment. Your experience must have been that in more than 50 per cent. of these bedside treatments, the operation of opening up the pulp-chamber or root-canals is involved, and the ineffectual struggle to accomplish this without the dental engine is most annoying. I have therefore constructed a hand engine, which, while not especially rapid or powerful, serves all purposes.

The engine equipment is carefully selected to furnish the sharpest and most rapid-cutting burs. A full set of Beutelrock hand and engine root-canal instruments has been of the greatest use. The broaches, canal-dressing instruments, and pluggers are just as important. The explorers, scalers, extracting forceps, elevators, crown-slitting instruments, mouth-props, and most of the other larger

instruments are transferred from the office operating room to the carrying case at the time of the visit. They are sterilized in the office, and placed in sterile towels which have been sewed into pockets, so that they may become instrument rolls, easily washed and sterilized for each visit. Napkins, cotton rolls, and a saliva-ejector operated by a hand-bulb are always taken. A hypodermic syringe, ethyl chlorid tube, and other apparatus for local anesthesia are included.

The subject of a general anesthetic for any case requiring it is one solved either by the dentist or the attending physician. I have a portable nitrous oxid apparatus available at all times, and the somnoform equipment has

also been found satisfactory and compact. Of course the materials and instruments for making temporary fillings and dressings and oxyphosphate fillings are necessary, but permanent forms of fillings are not attempted. A small surgeon's case of lancets and probes is carried in the upper portion of the bag, and a reliable alcohol lamp is included. Where it is known that the residence visited is using the incandescent current for illumination—as is the case generally in Cincinnati—I include a sixteen-candle-power lamp with reflector and handle, and a good length of cord with socket plug. An electric battery hand-lamp is provided when current is not available.—H. T. SMITH, *Dental Summary*.

HINTS, QUERIES, AND COMMENTS.

REMOVABLE POSTS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—On page 1192 of the December 1906 issue of the *Cosmos*, you give Dr. Charles Taylor's idea in regard to posts that may be removed easily and without injury to the root. Dr. Taylor advocates a hollow post, and explains a very crude method for producing it.

The easiest and most practical method of making an article like this is the old, almost ancient mode of making hollow wire, which consists of drawing a piece of plate through a draw-plate, and the procedure is so simple, that it seems strange any other way is suggested.

Having cut a strip of metal about three times the diameter of the proposed post, bend up its edges until it is in the shape of an old-fashioned eaves-trough, then push it together at one end, and cut it in a slanting manner, so that this end may pass into the larger hole of the draw-plate, and be grasped by a strong pair of pincers and pulled through. This is easily accomplished if the metal is first rubbed with beeswax. By passing it through the holes, each a little smaller than the preceding, the tube is made, and can be soldered or not. It is best, however, to solder it before the final drawing, as that will give a smoother surface.

By continual drawings, a tube of any size may be produced. Of course it requires a

draw-plate of larger size than is usually found in a dental office. The largest hole in my largest plate is about the size of a No. 6 wire. But how many dentists possess a draw-plate of any kind, or know how to use one? And yet there is no tool for the laboratory more useful. To illustrate this fact, let me tell of a difficulty from which I escaped: A bridge with a loose facing was brought to my office; the pins of the facing were broken but not "started" in the porcelain. There was not a proper tooth for the case to be found in the city.

The stumps of the pins protruded just above the surface of the porcelain. I made a tube of platinum that would fit over these stumps, and bending it in the form of a U, placed the ends of this U on the pin-stumps, waxing them to place; then invested the whole in plaster and sand, laying a piece of iron wire across the sound part of the U to hold it when the wax should be removed. I then soldered this U to the pin-stumps, and cutting the bottom of the U, I had a tooth with two good pins.

In regulating appliances, and in many other things of use in our profession, a draw-plate is of inestimable service. Few know that with a draw-plate, a firm vise, and a strong pair of pincers, a wire one-eighth of an inch can be drawn by hand.

JAMES H. BEEBEE.

Rochester, N. Y.

OBITUARY.

DR. C. R. TAYLOR.

MEMORIAL RESOLUTIONS ADOPTED BY THE ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

Whereas, On roll-call at the opening session of the November 1906 meeting of the Illinois State Board of Dental Examiners, the name of Charles R. Taylor receiving no answering response makes us pause to pay tribute to his worth and memory. Little did we think at our last parting that at our next meeting our long-time friend and co-laborer, strong in all the elements that constitute a lovable man, would be beyond the reach of voice, and his chair stand vacant at our table—reminding us that the strongest ties of friendship must sooner or later be broken, but not forgotten. In token of our affection and appreciation of Dr. Taylor's influence in private and public life for the betterment of all who had the good fortune to know him, it is hereby

RESOLVED, That a page of our records be set apart, and the sentiments herein expressed be inscribed thereon.

DR. C. S. BECK.

MEMORIAL RESOLUTIONS ADOPTED BY THE PENNSYLVANIA STATE DENTAL SOCIETY.

Whereas, We, the friends, *confrères*, and fellow practitioners of the late Dr. C. S. Beck of Wilkes-Barre, have learned of his death; and

Whereas, We deeply regret the loss of our distinguished co-laborer and warm-hearted friend, to whose energetic life we owe so much in the advancement of dental science and organized society work; and

Whereas, By his labors this and kindred societies were advanced and the profession at large benefited; therefore be it

RESOLVED, That it is with deep and sincere regret we have learned of his death, and tender to the family our sympathy and deep sorrow; and, That a copy of these resolutions be sent to the family and spread upon the minutes.

DR. H. D. HARPER.

DIED, at Wilson's Sanitarium, N. C., Saturday, November 24th, as the result of an attack of pneumonia, H. D. HARPER, D.D.S., in his sixtieth year.

Dr. Harper was born in Johnson county, Bentonville, N. C., May 4, 1847. His father, John Harper, was a prominent planter. His youthful days were spent upon his father's farm, until in 1864, when seventeen years of age, he entered the Confederate army as a member of Griswold's Independent Company of Goldsboro. He was in a short time detailed as a courier to Col. Stephen D. Poole, and served in that capacity through the remainder of the strife, except that in the battle of Cobb's Mill, near Kinston, by his own request he was allowed to join his company in the fight. At the close of the war he returned to his father's home, and remained there with him until 1869. During that year he entered the Kentucky University, where he received a literary and ministerial education, also reading dentistry during the five years he remained there. By his own industry he earned the necessary funds to pay his way through college by working as a painter and engaging in other mechanical pursuits, until he was finally graduated from that institution. He was afterward graduated from the dental department of the University of Tennessee.

For some time he traveled, practicing dentistry and preaching. He was at one time state evangelist for the Christian Church. In 1882 he located permanently in Kinston, N. C., where he continued in active practice until the time of his illness, which in one week terminated fatally.

Dr. Harper was well known as a dentist through the eastern part of the state and drew patronage from many counties. He stood in the front rank of his profession, and in 1894 he was elected president of the North Carolina State Dental Society without a dissenting vote, and presided in 1895 at the Salisbury meeting with great satisfaction to all its members.

Dr. Harper was a many-sided man, an example of the best type of citizenship, endowed by nature with a discriminating mind, a comprehensive grasp of human affairs, excellent judgment, an unflinching integrity, and above all, keenly developed human sympathies. His counsel was sought in all directions which tended toward the betterment of affairs in his community. His grasp of business methods and sound financial instincts were practically recognized in the demand for his co-operation in matters of this character. He was chairman of the County Board of Education for five years, and severed his connection with it during his last term by resignation. He was called to the command of the Naval Reserves when first organized in Kinston by the unanimous vote of the division. When practice forbade his longer service to the company, he was presented with his sword in recognition of his faithful and loving services. During the Spanish-American War he was appointed chaplain of the naval battalion of the state.

Dr. Harper was second vice-president of

the North State Mutual Life Insurance Company, director in several other corporations in Kinston, and also in the Chesterfield Mfg. Co. of Petersburg, Va. An appreciative biographer says of him, "Doubtless he was more universally liked in the community than any other; the rich, the poor, male and female, child and adult, all were his friends because he was theirs. His spirit of geniality and true Christian nobility, his kindly smile and warm heart, found a welcome everywhere at all times. He was the apostle of sunshine in this community; rare indeed were the times when the smile left his face."

Dr. Harper was fatally stricken while apparently in good health. He had gone a week previously to visit his second daughter, who was ill with typhoid fever at Wilson's Sanitarium. It was this illness which proved to be his last.

Dr. Harper married, April 21, 1877, Miss Delia Coward. His wife died in the spring of 1898, leaving six children to his guardianship.

SOCIETY NOTES AND ANNOUNCEMENTS.

[JAMESTOWN EXPOSITION, NORFOLK, VA., 1907.]

JAMESTOWN DENTAL CONVENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

Exposition Company, the Southern Branch of the N. D. A., and the Virginia State Dental Association, will convene at Norfolk, Va., September 10 to 12, 1907. The Jamestown Exposition Company have appointed the above named gentlemen as a Committee on Organization, to elect officers in advance of the meeting, to appoint all committees, to finance the meeting, and to bring it to a successful termination.

The Committee on Organization have appointed Dr. Clarence J. Grieves, Baltimore, Md., general chairman of the Clinic Committee and Supervisor of Clinics.

A number of well-known men will assist him on the General Committee. State clinic chairmen have been selected from every state in the Union. The clinics are to be the principal feature of the convention, and it is expected to bring about the largest and most instructive dental clinics ever held. A surgical clinic will also be held under the supervision of Dr. L. M. Cowardin, Richmond, Va.

The Jamestown Dental Convention, to be held under the auspices of the Jamestown

The other members of this committee are J. Y. Crawford, Nashville, Tenn., and A. G. Friedrichs, New Orleans, La. Dr. F. W. Stiff, Richmond, Va., is general chairman of the Membership Committee.

Assistant state chairmen have been appointed from every state in the Union. Already membership fees are being sent in, and the promise is for the largest gathering of dentists ever held. Only five essays will be read at the convention, one by Prof. W. D. Miller, another by Prof. G. V. Black, and the other three by well-known southern dentists.

Several exhibits of much interest to the profession will be held under the auspices of the convention; among them the dental manufacture exhibit in charge of Dr. John W. Manning, chairman, Norfolk, Va.; a comparative anatomy exhibit, in charge of Dr. W. M. Bebb, chairman, Los Angeles, Cal., which exhibit will consist of three thousand comparative anatomy specimens, and also numerous other collections of interest; a dental historical exhibit, consisting of ancient instruments, operative and prosthetic work, books and photographs, under the chairmanship of Dr. Wm. H. Trueman, Philadelphia, Pa.; the orthodontia exhibit, showing a large collection of models, etc., under the chairmanship of Dr. H. E. Kelsey, Baltimore, Md. The U. S. Naval dental exhibit, showing 3000 charts of the mouths of midshipmen, under the chairmanship of Dr. John S. Marshall, San Francisco, Cal., will also show the equipment, method of keeping records, etc., used by the dental corps.

A full list of the various officers, who are to be elected in advance by the Committee on Organization at their next meeting in February 1907, and of the committees, will appear in due time in the various dental journals. The Committee of Organization is expected to select officers in advance in order that the officers may be prepared for their duties before the actual meeting of the convention.

A cordial invitation is extended to all reputable members of the profession to become members of this convention, and to assist the Committee on Organization in bringing about one of the best, if not the best, dental meeting ever held.

The Exposition itself offers an excellent opportunity for the busy practitioner to take a delightful vacation, see the wonderful his-

torical and naval and military exhibits at the Exposition, and also to participate in this meeting. The membership fee, which is \$5.00, should be sent to Dr. F. W. Stiff, treasurer, 600 East Grace st., Richmond, Va.

For further information address

H. W. CAMPBELL, Sec'y,
Suffolk, Va.

G. V. BLACK DENTAL CLUB CLINIC.

THE annual Midwinter Clinic of the G. V. Black Dental Club will be held at the Old Capitol building, St. Paul, Minn., on Tuesday and Wednesday, February 26 and 27, 1907.

The clinic committee has prepared the best program possible for it to arrange. The operative clinic and the list of essayists speak for themselves. The list of table clinicians has not been completed. Correspondence with exhibitors leads us to the belief that much which is new will be displayed for those coming from a distance.

Those who are interested in progressive dentistry are most cordially invited to attend our meeting, and take part in the discussion of the clinics and the ideas which will be presented by the essayists.

Special rates are given on all railroads. As there will be other conventions held in St. Paul at the same time, it is suggested that arrangements be made in advance for rooms. The Merchants Hotel and the Ryan Hotel have made a special rate for those attending the meeting. The secretary will gladly reserve rooms for all writing him.

TUESDAY, February 26th, 10 A.M.

Progressive clinic: Gold filling in mesio-occlusal surfaces of upper first molar and upper bicuspids.

1. Dr. A. C. Searl, Owatonna, Minn.
2. Dr. F. S. James, Winona, Minn.
3. Dr. J. W. S. Gallagher, Winona, Minn.

Dr. Wm. Finn, Cedar Rapids, Iowa, will demonstrate the entire method of procedure as followed by these clinicians, using for this purpose a large wooden tooth, clay, etc.

Progressive clinic: Gold filling in mesio-incisal surface of upper canine, lateral and central incisors.

4. Dr. G. N. Beemer, Mason City, Iowa.
5. Dr. W. R. Clack, Clear Lake, Iowa.

6. Dr. F. G. Richardson, Mason City, Iowa.
Dr. F. S. Robinson, Chippewa Falls, Wis., demonstrator.

Progressive clinic: Gold filling in mesial or distal surface of upper canine and lateral and central incisors.

7. Dr. S. Bond, Anoka, Minn.

8. Dr. A. C. Fawcett, Rochester, Minn.

9. Dr. C. H. Robinson, Wabasha, Minn.

Dr. A. M. Lewis, Austin, Minn., demonstrator.

10. Gold filling, occlusal surface of an upper or lower molar, demonstrating use of cohesive and non-cohesive gold. Dr. W. H. K. Moyer, Little Falls, Minn., demonstrator.

11. Porcelain demonstration. Dr. J. O. Wells, Minneapolis, Minn.

12. Amalgam demonstration. Dr. G. D. Moyer, Montevideo, Minn.

Afternoon, 2 P.M.

1st. President's Address. Dr. A. C. Searl.

2d. Report of Clinics.

3d. Essay, "Points of Contact, Their Use and Abuse," by Dr. W. H. K. Moyer.

4th. Essay, "Specific Gravity of Gold Filling," by Dr. K. E. Carlson. (Dr. Carlson will report the results of some experiments which he has made and is still making.)

Evening, 8 P.M.

Illustrated lecture by Dr. G. V. Black, Chicago, Ill.

WEDNESDAY, February 27th, 9 A.M.

The first three clinics are the same as those which will be made Tuesday morning.

Progressive clinic:

1. Dr. C. N. Booth, Cedar Rapids, Iowa.

2. Dr. Wm. Finn, Cedar Rapids, Iowa.

3. Dr. J. V. Conzett, Dubuque, Iowa.

Dr. J. W. S. Gallagher, demonstrator.

Progressive clinic:

4. Dr. J. J. Booth, Marion, Iowa.

5. Dr. T. F. Cooke, Burlington, Iowa.

6. Dr. W. G. Crandall, Spencer, Iowa.

Dr. F. S. James, demonstrator.

Progressive clinic:

7. Dr. S. R. Holden, Duluth, Minn.

8. Dr. A. M. Lewis, Austin, Minn.

9. Dr. F. S. Robinson, Chippewa Falls, Wis.

Dr. W. R. Clack, demonstrator.

10. Amalgam demonstration. Dr. J. B. Pherrin, Central City, Iowa.

11. Porcelain demonstration. Dr. F. S. Yaeger, St. Paul, Minn.

12. Gold inlay. Dr. C. E. Woodbury, Council Bluffs, Iowa.

Afternoon, 2 P.M.

1st. Report of Clinics.

2d. Essay, "The Relation of the Dentist to the Public and to His Patients," by Dr. T. F. Cooke, Mediapolis, Iowa.

3d. Essay, "The Treatment of the Teeth of Children," by Dr. C. N. Johnson, Chicago, Ill.

It is an impossibility to give a list of the table clinicians. A number of men have signified their intention to be with us, and give table demonstrations, which will be of the greatest value to all. This portion of the program has not been completed.

The secretary will be pleased to furnish any information necessary.

R. B. WILSON, Sec'y,

Am. Nat. Bank bldg., St. Paul, Minn.

BANQUET TO DR. G. V. BLACK.

THE Fraternal Dental Society and the St. Louis Society of Dental Science will unite in giving a banquet in honor of Dr. G. V. Black, at the Jefferson Hotel, St. Louis, Mo., on the evening of January 15, 1907. The afternoon of the same day Dr. Black will deliver an illustrated lecture on some phases of operative dentistry.

The long and untiring efforts and valuable scientific contributions of Dr. Black easily make him the foremost dental scientist the world has ever produced. No dentist, living or dead, so much deserves the thanks and praise of his professional associates. A most cordial invitation is extended to the members of the profession to be present at both lecture and banquet, and to assist in honoring Dr. Black. Those desiring reserved covers for banquet will remit \$5.00, the price per plate, to Dr. Richard Summa, secretary, Oriel bldg., St. Louis, before January 12th.

Committee—Geo. A. Bowman (chairman), A. H. Fuller, Edward H. Angle, D. O. M. LeCron, Adam Flickinger, Wm. Conrad, Burton Lee Thorpe. GEO. A. BOWMAN, Chairman.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE American Dental Society of Europe will hold its next annual meeting in Rome, Italy, on March 29 and 30 and April 1. A very cordial invitation is extended to members of the profession to be present.

As it is the first meeting of the society in the Eternal City, it is hoped it may be the most enjoyable one in its history.

J. W. GALE, *Hon. Sec'y*,
79 Hohenzollern-Ring, Cologne (Rhine), Ger.

A CALL FOR AN INTERNATIONAL MASS MEETING OF DENTISTS.

THE "Open Letter" in the November journals has brought out responses having one purport, viz, showing a decided interest in the subject of preventive dentistry. From every point of the compass comes the unanimous concurrence in the opinion that it will be wise to issue the call. Therefore all dentists are invited to meet on Monday—the day previous to the annual meeting (January 15, 1907) of the New York Odontological Society at the Hotel Knickerbocker, Thirty-second st. and Broadway, at 9.30 A.M. Please respond in person or by correspondence. Address any of the names in "Open Letter," or

DR. G. ALDEN MILLS,
226 Central Park, West.

P. S. Original articles will be gladly received.

ALUMNI ASSOCIATION OF CHICAGO COLLEGE OF DENTAL SURGERY.

TWENTY-FIFTH ANNIVERSARY REUNION.

ON January 16 and 17, 1907, the Alumni Association of the Chicago College of Dental Surgery will celebrate the twenty-fifth anniversary of the establishment of the college by holding a grand reunion and clinic. Arrangements have been made for a number of papers, a very extensive clinic, a theater party, and a banquet. A railroad rate of a fare and a

third for the round trip from all points in the United States and Canada on the certificate plan has been arranged for.

A cordial invitation is extended to the general profession to be present, as well as all members of the Alumni Association, and all graduates of the college.

R. C. BROPHY,
J. P. BUCKLEY,
Committee on Publicity.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

NOTICE TO THE ALUMNI.

ANY alumnus not having received a copy of the souvenir number of the *Pennsylvania Dental Times*, giving the proceedings of the golden anniversary of the Pennsylvania College of Dental Surgery, may secure the same by sending his name and address to

WILBUR F. LITCH, *Dean*,
Eleventh & Clinton sts., Philadelphia, Pa.

SOUTHERN NEBRASKA DENTAL SOCIETY.

THE second meeting of the Southern Nebraska Dental Society was held in Superior, Nebraska, November 13 and 14, 1906, in Dr. J. Frank Nelson's office; good attendance and a fine spirit. Several good clinics were given, also some fine papers by Dr. J. M. Prime of Oxford; Dr. N. H. Morrison, and Dr. E. A. Thomas of Red Cloud. Next meeting will be held in Superior in January.

W. A. MCHENRY, *Sec'y*.

OHIO STATE DENTAL SOCIETY.

AT the forty-first annual meeting of the Ohio State Dental Society, held in Columbus, December 4, 5, and 6, 1906, the following officers were elected: H. C. Brown, Columbus, president; C. I. Keely, first vice-president; W. H. Whitslar, second vice-president; Weston A. Price, treasurer. Board of Directors (for three years)—W. H. Todd, A. O. Rose, W. A. Barber, H. T. Smith.

F. R. CHAPMAN, *Sec'y*,
305 Schultz bldg., Columbus, Ohio.

ONTARIO DENTAL SOCIETY.

THE eighteenth annual meeting of the Ontario Dental Society will be held in the College Building, Toronto, Ont., February 25, 26, and 27, 1907.

A. E. WEBSTER, *Sec'y Program Committee*,
Toronto, Ont.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-third annual convention of the Connecticut State Dental Association will be held at New London, Conn., April 16 and 17, 1907.

An excellent program is assured.

EDWARD S. ROSENBLUTH, *Sec'y*,
1051 Main st., Bridgeport, Conn.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE tenth annual session of the Southern California Dental Association will be held in Los Angeles, May 6, 7, and 8, 1907, at the same time that the Imperial Council of Mystic Shrine meets here, and all members of the dental profession contemplating visiting southern California at that time will confer a favor upon the association by notifying the secretary.

CHAS. M. BENBROOK,
455 S. Broadway, Los Angeles, Cal.

ARMY DENTAL CORPS.

CONTRACT Dental Surg. Hugh G. Voorhies will proceed to Fort William McKinley, Rizal, for duty, relieving Contract Dental Surg. George I. Gunckel, who will proceed to Camp Stotsenburg, Pampanga, for duty. Contract Dental Surg. George E. Stallman will proceed to Camp Wallace, Union, for duty. (Oct. 2, D. Luzon.)

Dental Surg. William H. Ware will proceed to Zamboanga, Mind., for duty. (Oct. 4, Phil. D.)

Dental Surg. George I. Gunckel, from duty in the Philippines, and will proceed on the first available transport sailing after Feb. 1, 1907, from Manila to San Francisco, Cal. (Nov. 30, W. D.)

Examining and Supervising Dental Surg. Robert T. Oliver, U. S. A., is detailed to represent the Medical Department of the Army at the meeting of the Executive Council of

the National Dental Association to be held in Washington, D. C., December 8, 1906. (Dec. 7, W. D.) Contract Dental Surg. F. Homer Wolven will remain on duty at Fort Monroe, Va., to February 1, 1907, upon which date he will proceed to Fort Hamilton, N. Y., for duty for a period of six weeks. (Dec. 10, W. D.)

A PUBLIC DENTAL LIBRARY

IN THE

City of Columbus, Ohio.

THE Trustees of the new Columbus Carnegie Library Building, a handsome structure costing \$250,000, have set apart a room 40 by 60 feet for the exclusive use of a Dental and Medical Library.

The local dentists have organized a Dental Library Association for the express purpose of bringing this matter to a successful issue, and the work thus far accomplished far exceeds our expectations. The Columbus dentists alone have donated \$500 in cash and a number of books and magazines.

To make this library complete in embracing all known works pertaining to our specialty and complete files of all the journals published, we desire the co-operation of every dentist in the state. Any old and rare works, copies of old journals, etc., will be gratefully received, inscribed with the name of the donor, and recorded to his credit in the library catalog. Please communicate with us concerning any literature you may have that you can donate to this cause, giving titles and authors of books; names and dates of journals, etc. In case of duplication they will be valuable for exchange with other libraries.

W. H. TODD, *Pres.*,
190 S. High st.
EDWARD C. MILLS, *Sec'y*,
10 Y. M. C. A. bldg.

INDIANA BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Indiana State Board of Dental Examiners will be held in rooms 11 and 12, State-house, Indianapolis, January 8 to 11, 1907. All applicants for registration will be examined at this time. For further information, blanks, etc., apply to

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE Board of Dental Examiners of the District of Columbia will conduct the semi-annual examination at the Dental Department of Georgetown University, Wednesday, Thursday, and Friday, January 2, 3, and 4, 1907. All applications must be accompanied with a fee of ten dollars. For further information address

WILLIAM B. DALY, *Sec'y*,
1311 R. Island ave., N. W., Washington, D. C.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held Monday, January 28, 1907, at the Hotel Pfister, Milwaukee, Wisconsin.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice to a reputable dentist for five years.

For further particulars apply to

J. J. WRIGHT, *Sec'y*,
1218 Wells bldg., Milwaukee, Wis.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE next examination of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, South Dakota, January 29, 30, and 31, 1907, beginning at 1.30 P.M. All candidates for examination must bring diplomas from reputable dental colleges or affidavit of having been engaged in the practice of dentistry for at least three years immediately preceding said examination. Instruments and materials necessary to do all kinds of operative and prosthetic work will be needed at this examination. Vulcanizer and lathe will be furnished by the board. All applications must positively be in the hands of the secretary by January 22d.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

IOWA BOARD OF DENTAL EXAMINERS.

THE Iowa State Board of Dental Examiners will hold their next meeting for examination at Iowa City, February 6, 7, 8, and 9, 1907. Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination.

Address all communications to

E. D. BROWER, *Sec'y*, Le Mars, Iowa.

NATIONAL DENTAL ASSOCIATION.

COMMITTEE ON HISTORY OF DENTISTRY.

SOON after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the

question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 400, leaving 300 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put

through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.

WM. H. TRUEMAN, Philadelphia.

GORDON WHITE, Nashville, Tenn.

H. L. AMBLER, Cleveland, Ohio.

JAS. McMANUS, Hartford, Conn.

J. Y. CRAWFORD, Nashville, Tenn.

A. H. FULLER, St. Louis, Mo.

S. A. FREEMAN, Buffalo, N. Y.

W. E. BOARDMAN, Boston, Mass.

CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.

CHAS. McMANUS, *Ch'man*, Hartford, Conn.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER 1906.

November 6.

No. 835,358, to THOMAS F. KENNEDY. Rubber dam adjuster.

No. 835,365 to ROBERT W. MORGAN. Combined tooth-brush and holder.

No. 835,432, to HENRY A. HUGHES. Rubber dam or bib holder.

November 13.

No. 835,628, to JOSEPH MILLER. Instrument for softening dental trial plates.

No. 835,709, to CHAUNCEY D. MILLER. Tooth-brush.

No. 835,732, to WILLIAM E. LAWRENCE. Tooth-brush holder.

November 20.

No. 836,196, to SHIRLEY S. MILLETT. Duplicating and swaging device.

No. 836,299, to WELBY W. BURGIN. Dentist's tweezers.

November 27.

No. 836,967, to WALTER H. GRANT. Dental mirror.

No. 837,171, to HENRY W. WOLFE. Apparatus for administering anesthetics.

THE DENTAL COSMOS.

Vol. XLIX.

FEBRUARY 1907.

No. 2.

ORIGINAL COMMUNICATIONS.

EXPERIMENTS AND OBSERVATIONS ON THE WASTING OF TOOTH TISSUE VARIOUSLY DESIGNATED AS EROSION, ABRASION, CHEMICAL ABRASION, DENUDATION, ETC.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Ger.

(Continued from page 23.)

(II.)

IN continuation of the investigations reported upon in the preceding issue of the Cosmos, I reproduce, first, in Fig. 16 a photomicrograph of washings obtained from prepared chalk, showing its rough character and the necessity, in the fabrication of tooth-powders, of using only chalk which has been very carefully prepared.

The same is true of powdered talc, which may contain as impurities gritty substances in varying amounts dependent upon the source of the stone and the care used in its preparation. The proportion of such impurities is naturally small, but it does not require much to make an impression upon the teeth in the course

of years. Fig. 17 shows the action of sediment from a tooth-paste containing talc upon a glass plate. The sediments obtained from many specimens of prepared chalk are quite as sharp. They may be tested by rubbing them on a glass plate with a strip of pink gutta-percha or with a bit of glass.* I wish also

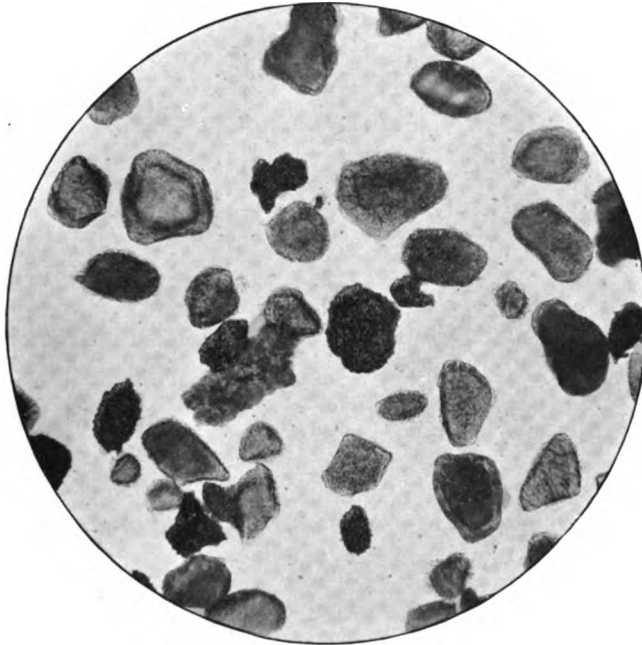
*In this connection I wish to call attention to the sediment shown in Fig. 9 of the first section of this article (page 11, January Cosmos), and which I was at first inclined to think was powdered oyster-shell, but this was incorrect, as I find the residue to be due in a great part to impurities commonly present in the substance used in the manufacture of this paste. The large particles in

to call attention to Figs. 18-20, which show the striking results sometimes obtained by the simple use of the brush and powder, and throw some light upon puzzling cases occasionally met with in practice.

In Fig. 18 the effect is shown of brushing four teeth from different dentures

show large wedge-shaped defects at the necks extending to different distances upon the facial surfaces. The difference in the action upon the bicuspid and its neighboring incisor is surprising, particularly to the casual observer, to whom the surface of the enamel of the incisor seems to have suffered no change at all,

FIG. 16.



Washings from prepared chalk.

for 5 hours with calcium carbonate and 18 hours with 20 per cent. pumice added. No. 1 is a sound central incisor almost colorless, having but a trace of gray in it. No. 2 is a dark gray senile bicuspid. Nos. 3 and 4 are molars, No. 3 inclining to the gray type while No. 4 is distinctly white. We see that the bicuspid has lost the whole of its enamel and a considerable part of the dentin, and that its surface is scored by numerous parallel grooves. The other teeth

although a careful examination will show that the enamel plate is very thin and is on the point of breaking through on the margin next to the bicuspid. The enamel on No. 4 is also as thin as paper, so that the difference in the action upon the different teeth is not so great as it appears.

Fig. 19 is a deciduous tooth brushed with a gritty tooth-powder. It shows a fairly deep wedge-shaped defect at the neck and two circumscribed deep defects of the enamel separated from each other by a bridge. It is sometimes difficult to understand why certain spots are picked out, but such is the case. It may be accounted for in part by the

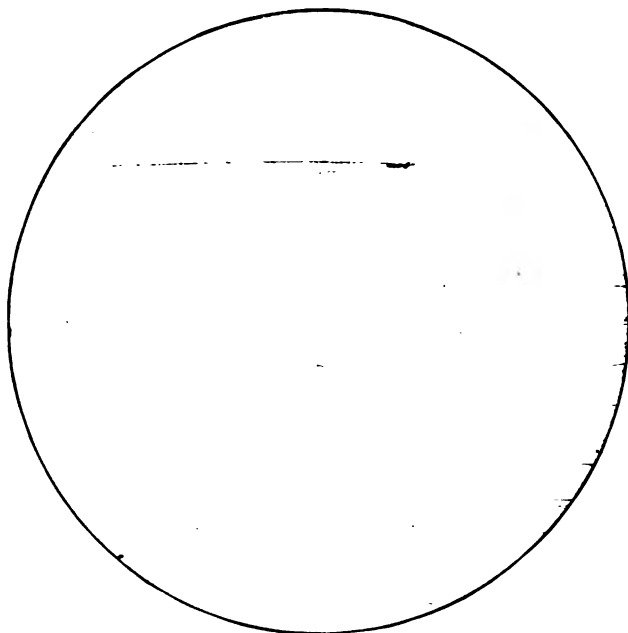
Fig. 6 are equivalent to large crystalline bodies which I have found in certain preparations of precipitated chalk.—W. D. M.

presence of weak spots in the enamel and in part by the particular direction given to the bristles by the configuration of the neighboring teeth or gums. Then, again, the whole surface of the enamel may be worn down until it breaks through at some particular more prominent spot; then, the dentin being exposed,

more energetically than is the case in the mouth. In those experiments in which a strip of pink gutta-percha was fixed parallel with the alveolar border, the bristles, being prevented from spreading out freely on the corresponding side, cut especially deep.

Then again, on brushing the facial sur-

FIG. 17



Action of sediment from a tooth-paste containing talc, on glass.

the abrasion extends rapidly from that particular point, and considerable progress may be made in a comparatively short time. In the present case the enamel is much thinned down over the whole surface of the tooth.

In my experiments I have found a greater tendency toward the cutting by the brush into the neck of the teeth than we find usually in the mouth in severe cases of erosion. This may be due in part, I think, to the fact that only one row of teeth is brushed at a time, and there being no sensitive gums to ward off the brush as well as no gums to protect the necks of the teeth, they are rubbed

faces of our teeth we naturally close or very nearly close the mouth and brush both rows at the same time. The bristles spread out on the surfaces of the teeth and only the very outside rows reach the necks of the teeth. Or again, if the mouth is not completely closed, so that a space remains between the two rows of front teeth, the bristles working in this space may wear away the cutting edges and cause a certain amount of shortening of the teeth. This is imitated in an experiment in which a bar of wood was placed opposite the cutting edges of the lower front teeth at a distance of from 2 to 3 mm. from them. The effect of

brushing for eighteen hours with an English tooth-paste was to shorten the teeth, as seen in Fig. 20. They also show considerable wearing at the neck, and

powder. My views on this question will be given later.

FIG. 20.



Shortening of the teeth by the action of brush; also longitudinal defect in the right lateral produced by brushing horizontally. In the right central the defects produced at the neck and on the cutting edge are joined by a longitudinal groove.

FIG. 18.



Selective action of brush on one particular tooth.

almost total destruction of the enamel of No. 1, which is worn away in a very irregular manner. In the other incisors the enamel is also very much worn down,

FIG. 19.



Localized penetrating action of brush.

and the dentin is beginning to appear in No. 4 toward the neck.

About 2½ boxes of tooth-paste were used in producing this result—a quantity which I judge many patients use up in one year or possibly much less time.

Notwithstanding these pronounced and diversified results produced by the action of the brush and powder on the teeth, I am free to confess that, in some cases which I have seen, the action of an acid or other chemical body as predisposing cause, rendering the tissue more susceptible to friction, would facilitate the explanation.

It must not be inferred from the above that I discountenance the use of the tooth-brush or a proper use of a proper

II. CHEMICAL SUBSTANCES WHICH ATTACK THE INORGANIC CONSTITUENTS OF THE DENTIN AND ENAMEL AS A CAUSE OF WASTING.

It is practically only acids and acid salts that we have to deal with here. The fact is too well known to require particular emphasis that dilute solutions of organic as well as of inorganic acids and acid compounds have a pronounced action upon the hard tissues of the teeth. In the case of the enamel the appearance presented under the microscope has led to the supposition that the acid dissolves the cementing substance between the enamel prisms, thereby permitting them to fall apart, pretty much as the bricks in a wall from which the mortar has been dissolved out. It is a question, however, whether the breaking up of the enamel is not due rather to a solution of the cortical layers of the enamel prisms by the acid. In the case of the cement and dentin a veritable decalcification takes place, the calcium salts being extracted by the acids, which leave the organic basis sub-

stance but slightly altered. Whether and to what extent the acid forms a new compound with the calcium salts of the tooth tissue or simply holds them in solution is a question deserving of much more thorough study than it has heretofore received. It is too complicated to be dealt with here and will be taken up on another occasion. Suffice it to say that different acids act with very varying degrees of intensity upon the tissue of the tooth—from nitric, hydrochloric, lactic, etc., which even in dilute 1 per cent. solutions speedily decalcify the tissue, to thymic, carbolic, and many other acids whose action is very slight or practically nil.

Accordingly, it must not be supposed that every substance that contains acid properties is destructive of tooth tissue. Some acids form soluble and others insoluble compounds which may be precipitated upon the surface of the tooth or in its superficial layers. Sometimes the calcium salts extracted from the dentin are re-precipitated upon its surface. Of particular importance in this connection is the comparative rapidity with which different acids act upon dentin and enamel. If we suspend a tooth in a solution of hydrochloric, acetic, nitric, lactic, or phosphoric acid, or in acid sodium phosphate, we will find that the dentin is decalcified much more rapidly than the enamel. In oxalic acid, on the other hand, as well as in tartaric, mucic, and probably some others, the enamel is acted upon as much as or even more intensely than the dentin, a result which should not be lost sight of in an attempt to determine the part which acids may have in the production of wasting.

Very surprising results are obtained by the action of oxalic acid upon the teeth. A tooth suspended in a 1 or 2 per cent. solution of this substance will become studded in a few days with numerous hollow spherules from 0.5 to 4 mm. in diameter. They are white, semi-transparent and respond to the test for calcium oxalate. The enamel of the tooth is attacked in a very striking manner, being dissolved in pits and channels looking very much as if worm-eaten. (Fig.

21.) The dentin is much less affected than the enamel. So, too, a tooth split into halves and left for four weeks in grape-juice, with the split surface up, be-

FIG. 21.



Strange effect of a 1 per cent. solution of oxalic acid on the enamel.

came coated with crystals, whether tartrates or phosphates was not determined. In this case, too, the action upon the dentin was much less pronounced than upon the enamel. (Fig. 22.)

ACTION OF VAPORS OF POWERFUL ACIDS.

All acids, as far as we know, in acting upon enamel and dentin leave a rough unpolished surface, and no one as yet has been able to produce anything which could be mistaken for wasting by the action of acids alone.

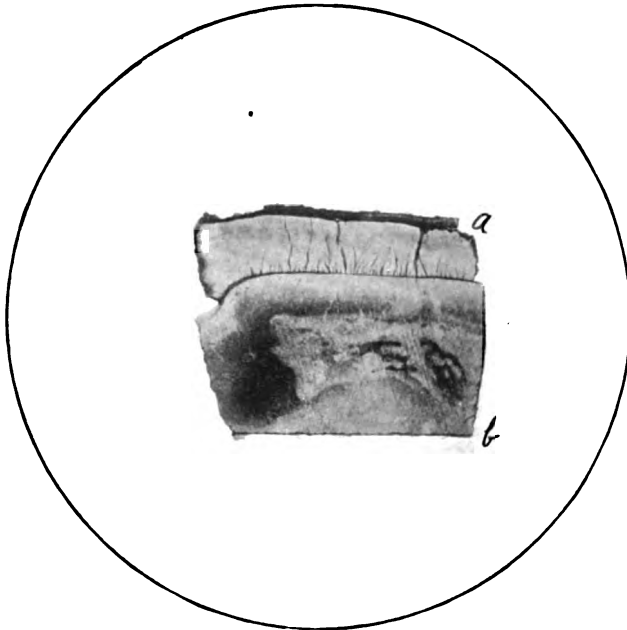
We occasionally meet with the statement made by some author that he has produced erosion by subjecting a tooth to the action of some acid. Usually neither the strength of the acid nor the length of time during which the tooth was exposed to it have been given, so that it is not possible to verify such reports. After having examined over a dozen different acids and acid salts in various concentrations I am convinced that such reports are to be accounted for on the supposition that the author has not given the tooth a sufficiently careful examination. The nearest approach to the production of wasting by acids alone is found in the results which I have obtained by the action of the vapors of powerful acids or acid mixtures (strong nitric acid, nitro-

hydrochloric acid, or a mixture of nitric and sulfuric acids).

At the first annual meeting of the Standesverein Berliner Zahnärzte, Professor Levin reported a case of severe erosion observed on the teeth of workmen in dynamite manufactories. A greater part of the crowns of the lower incisors

contact with the tooth, both dentin and enamel, *not only the inorganic but the organic portions as well*, were so completely disintegrated that in rubbing over the surface but slightly with a soft tooth-brush the tissue was brushed away, leaving a hard polished surface. The wasting in this case is practically equivalent

FIG. 22.



Stronger action of grape-juice on enamel (a) compared with dentin (b).
Black lines denote decalcified tissue.

in particular and the cutting edges of the upper incisors were destroyed, and the defects had a perfectly smooth polished surface. The case appeared very puzzling to me until it became clear by the following experiment: A small quantity of a mixture of about equal parts of sulfuric and nitric acids, which is used in the manufacture of dynamite, was put into a flask, and a tooth was suspended above the liquid by means of a platinum wire. The liquid was renewed every day, the tooth being inclosed in a rubber tube containing a small hole at one point so as to expose a limited portion of dentin and enamel. Where the fumes came into

to erosion, as only a minimum of mechanical action is necessary to produce the smooth surface. The eroding body is nitrogen peroxid (N_2O_4), and the same effect may undoubtedly be obtained by exposing teeth to the action of the fumes of fuming nitric acid alone, which also gives off N_2O_4 . A similar result is produced by the vapors (chlorin) given off by nitro-hydrochloric acid.

In a conversation with Dr. Davenport of Paris on the subject of wasting of the teeth, he referred me to a communication published by him in the Transactions of the American Dental Association, 1881. This communication shows

that he had made the clinical observations reported by Levin twenty-six years ago. In Davenport's case the upper central incisors were worn away one-half their length, the laterals to a less extent, and the canines a very little; the other teeth were not affected. Thus a wide space was left between the upper and lower incisors when the teeth were closed. No teeth could be seen during conversation, as they were worn away even with the line of the lips. The lower teeth, being completely covered, were not affected.

Up to eight years prior the patient had lived upon a farm, and at that time his teeth were perfect. He then engaged as a workman in the manufacture of nitric acid and oil of vitriol, when, to use his own expression, "The gases escaping from the retorts set my teeth on edge, and I soon noticed that they were wearing away."

He also stated that the teeth of all the other workmen were more or less affected, according to the extent that they were left uncovered by the lips; in some both the upper and lower teeth were involved.

The patient stated that the entire wearing away of his teeth had been accomplished within six months after his entering the factory.

It is not necessary to emphasize the fact that factors of this nature do not come into consideration in ordinary cases of wasting.

ACTION OF CARBONIC ACID ON THE TEETH.

It is a well-known fact that carbonic acid is a powerful solvent for the calcium salts. Its action is easily demonstrated by putting sections of teeth or halved teeth in a bottle of water charged with carbonic acid. The dentin becomes decalcified to a considerable depth, and the enamel surface white and chalky in a few (two to four) weeks.

Inasmuch, now, as human saliva contains carbonic acid in solution, and carbonic acid is constantly being exhaled with the breath, it becomes a question demanding attention whether the CO_2

may not under certain circumstances have a deleterious effect upon the teeth. My attention was called to this matter by a case of mouth-breathing in which there was a wasting away of the enamel from the lingual surface of the upper incisors, and to a slight extent of the canines. The overbite was pronounced, and undoubtedly some of the wearing was simply due to attrition; but still I was not quite satisfied that this was the sole cause, particularly as the surfaces lacked in some parts the smooth polish present in attrition. As I could find no other apparent cause, especially no pronounced acid secretions, the thought suggested itself to me that possibly the current of exhaled air laden with CO_2 (in the expired air of human beings Vierordt, "Physiologie des Athems," found 4.6 to 5.2 per cent. of carbonic acid), impinging upon the surfaces of the upper incisors—the lower would be protected by the tongue—might have something to do with the wasting. For myself, I am not at all convinced that such is actually the case, and naturally the question arises, Why do not all mouth-breathers show the same phenomenon?

Nevertheless it appears to me that the matter is deserving of further attention. On the other hand, I think it may be considered as fairly certain that the CO_2 in the saliva does not have any detrimental effect on the teeth, as we should expect to find any such effect at the points where the saliva is poured into the mouth. The saliva of dogs, moreover, contains more free CO_2 than human saliva—namely, 19.3 to 22.5 volume per cent., and yet it does not appear to have any detrimental effect upon their teeth. An experiment in which a current of carbonic acid is made to impinge upon the surface of a tooth is now in progress, and will be reported upon in a subsequent issue.

The question has been brought up as to whether solutions of acids in water act differently from the same solutions in saliva. I have only one experiment to report on this question. Teeth were halved, and the corresponding halves subjected to a semi-saturated

solution of acid calcium phosphate in water and in saliva respectively for thirty-four days. The action of the watery solution seemed to be more intense than that of the solution in saliva. The temperature of the solutions is certainly not without influence, and I have therefore carried out my experiments as far as possible in the incubator.

ACTIONS OF ACID SOLUTIONS IN MOTION.

Very interesting intensified effects were produced by the action of acids in motion. Dropping, running, or trickling over the teeth in capillary currents, they cut grooves in the enamel with astonishing rapidity.

A fine stream of lactic acid 1 per cent., falling two and one-half feet on a block of ivory, produced rapid decalcification but no loss of substance. The surface was dull. A row of six teeth was fixed in plaster of Paris, and set on end with a fine stream of a 2 per cent. solution of phosphoric acid striking the surface of the upper teeth and trickling down over the others. The enamel of all the teeth was more or less cut and grooved in 60 hours. That of the upper two was totally destroyed, the dentin was exposed and superficially decalcified but not worn; the surface was dull.

A fine stream of a 1 per cent. solution of lactic acid, striking the third molar of a mandible and trickling down over the other teeth, produced a similar and nearly as intense an action in 50 hours.

The left side of the same jaw was exposed to a stream of a 1 per cent. solution of sulfuric acid for 25 hours (Fig. 23). The action was intense, nearly all of the teeth being denuded of their enamel, and the dentin softened, but with no loss of substance, the surface not being polished.

A single molar was exposed for 60 hours to a fine stream of acid calcium phosphate, 1 per cent. solution. The surface upon which the liquid impinged was denuded of enamel, and the dentin softened; a groove was also cut around the neck of the tooth. The acid sodium phosphate in the same strength had but a very slight effect.

Three capillary glass tubes were attached to the left maxilla in such a way that their points rested upon the buccal surface of the molars near the neck. Four silk threads were likewise fixed to the bone with sealing-wax, and by means of wax balls attached to the

ends were drawn down over the surfaces of the bicuspid, canines, and lateral incisors. The upper ends of the glass tubes, as well as of the threads, opened into a receptacle

FIG. 23.



Action of a running 1 per cent. solution of sulfuric acid. Teeth almost entirely divested of enamel.

constructed of a plate of wax. A 1 per cent. solution of phosphoric acid was introduced into this receptacle drop by drop, and worked its way through the capillary tubes and along the silk threads to and along the surfaces of the teeth. In the course of eight days deep undermining grooves were cut in the enamel, these in the case of the molars exposing the dentin.

In all of these experiments the result was simply decalcification, and in none was any effect resembling wasting produced. It seemed to me, nevertheless, to lie quite within the bounds of possibility that certain rare effects seen in the mouth may owe their origin in part to some action of this kind. Undoubtedly, currents of saliva are forced between or along the teeth in certain lines in chewing, and when the saliva or the food is acid, an effect might be brought about in time. I have seen the distal surface of an upper first bicuspid, where the second bicuspid was wanting, grooved out in very much the same way as the teeth are grooved in my experiments, and the thought has suggested itself to me whether this action might not in part have been brought about by acid secretions trickling down the channel formed by the tooth, the cheek, and the tongue. Moreover, it would not be at all surprising to me if a man who was in the habit of drinking acid wine and drawing it

through his teeth, as some do, should in time wear away the enamel from the approximal surfaces of his front teeth.

A section of the mandible containing three teeth was fixed with wax in a glass tube fourteen inches long, at right angles to the tube, which was then closed at one end and one-quarter filled with an acid brand of Rhine wine. The other end now being closed, the tube was rotated end over end during 48½ hours, the wine being occasionally renewed. A very considerable decalcification of the enamel was produced.

In all of these cases, however, the smooth polish is wanting, and when the surface of the dentin is reached it becomes decalcified (softened) but does not wear away, so that we must also admit that even with acid solutions in motion we are not able to produce wasting.

III. ACTION OF ACIDS OR ACID SALTS IN COMBINATION WITH MECHANICAL ACTION.

We have seen that it is quite possible to produce effects upon the enamel and dentin which are identical in appearance with wasting, by the use of the tooth-brush with tooth-powder, and on the other hand that it is quite impossible, so far as our present experience goes, to produce these effects by the application of any acid or acid compounds which are found in the mouth. The question now arises, What is the effect upon the teeth of the combined action of acids and of mechanical agents?

To bring about as decisive a solution of this question as possible, no time or pains were spared to carry out the required experiments, and to repeat them as often as necessary to secure reliable results. Some of the experiments are given here in detail, in order that each one may make his own study of them, and judge if I am right in my conclusions. In these experiments, human teeth and occasionally blocks of ivory were suspended in various acid solutions in different concentrations, and at specified times were removed and brushed with various different tooth-powders, or

constituents of tooth-powders. In some experiments whole teeth were used; in others, sections of teeth. In many cases the teeth were protected against the action of the acid by a coating of paraffin or sealing-wax, or by being inclosed in a rubber tube with a window cut so as to expose the dentin and enamel at one point.

In most of my experiments, however, sections of the human jaw with a number of teeth were used, or the teeth were fixed in rows in plaster of Paris or sealing-wax, which is much better for the purpose, and the facial surface covered with a thin layer of cotton, which was then moistened with the solution to be experimented with. This arrangement seemed to me to present the greatest similarity to the conditions in the mouth, the layer of cotton representing the mucous membrane of the lips or cheeks. In one case a human jaw was fixed in plaster of Paris, and a sheet of rubber dam so attached as to represent the cheek, thereby producing a natural interference in the application of the brush. In many cases the teeth, before beginning the experiment, were filled with gold, amalgam, or gutta-percha, and very valuable data were obtained from the comparative comportment of the different materials under the action of the acid and the brush.

Experiment 1. A block of ivory was suspended in a 1 per cent. solution of lactic acid so that one-half of it was immersed. It was daily removed and brushed with 10 per cent. pumice. The immersed (decalcified) half wore away much less rapidly than the other half. The result was the same whether a soft brush with 10 per cent. pumice, or hard brush with pure pumice, or even with corundum powder was used; only, when a wire brush was used the decalcified dentin was torn away much more readily.

Experiment 2. A number of carious teeth were halved and brushed with 15 per cent. pumice. The normal dentin wore away much more readily than the carious. This experiment was frequently repeated, always with the same result.

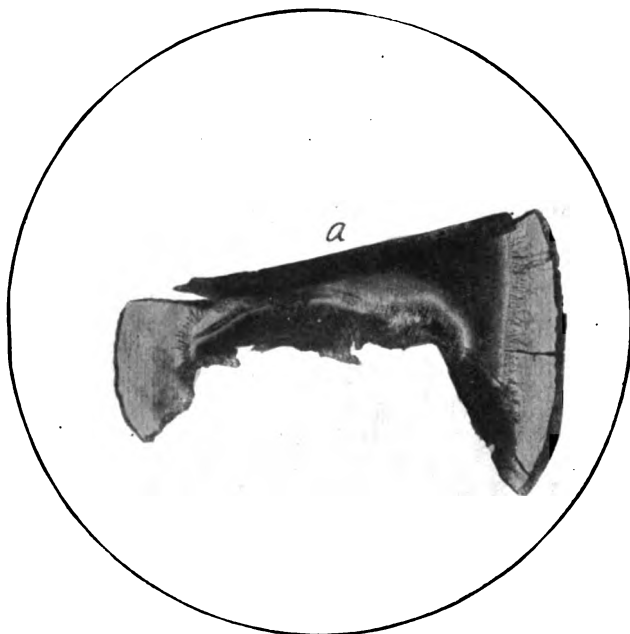
Experiment 3. A number of halved teeth were suspended in a solution of acid calcium phosphate, removed daily and brushed with 10 per cent. pumice. In many months the

enamel margins were destroyed, and the dentin, which was softened (decalcified) to a depth of over 1 mm., stood up above the enamel and showed no loss of substance. With the acid sodium phosphate the result was the same. (Fig. 24.) This experiment was continued for thirteen and one-half months; for the first two months with 1 per cent., then with 5 per cent. of acid sodium phosphate, and brushed daily with chalk. The mechanical action is here too slight in com-

powder. There was distinct loss of substance, with polished surface on both sides of the decalcified spot, which was comparatively but slightly affected and remained unpolished.

Polished surfaces of ivory subjected to the action of weak acids (1 per cent.) lose their polish in fifteen to thirty minutes. Human dentin gives up its polish much less readily.

FIG. 24.



Section of tooth exposed for two months to 1 per cent., and eleven and one-half months to 5 per cent. acid sodium phosphate, brushed daily on surface (a). Black portion denotes decalcified tissue.

parison with the chemical. By sufficiently increasing the brushing and reducing the strength of the acid we may obtain different results.

Experiment 4. A spot 3 mm. in diameter at the neck of a bicuspid was superficially decalcified by a 1 per cent. solution of lactic acid, and the tooth so fixed in a glass tube containing powdered corundum in water, that when the tube rotated, the mixture flowed back and forward over the surface of the tooth. In a week the non-decalcified surface showed a slight wearing away, which was absent at the spot decalcified. This experiment was repeated using brush and

Experiment 5. Fermented bouillon was applied on cotton to the teeth of the left side of a mandible, and both sides brushed daily for about ten seconds each with prepared chalk during one year and one month. The necks of the teeth on the right side showed slight action of the brush and a high polish, while on the left side there was more the appearance of beginning superficial caries.

Experiment 6. Five teeth, one having an amalgam and another a gold filling, were set in plaster of Paris, treated with 10 per cent. hydrochloric acid applied on cotton for ten minutes, then brushed for five minutes with pumice. This process was repeated four times, with the result that shallow grooves

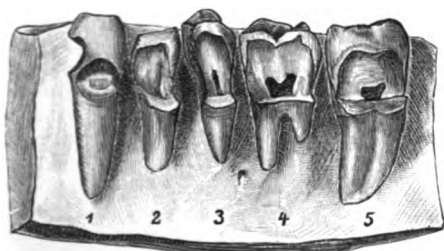
were produced at the necks of the teeth, and the enamel plates thinned down, *so that both of the fillings stood high above the surface*: fillings. dentin. and enamel having a fair polish.

Experiment 7. Four teeth were ground down from the approximal surface so as to expose the dentin; two of them were subjected to the action of pumice in water, the other two to the action of pumice in a 10 per cent. solution of hydrochloric acid on the motor brush for the same length of time. The former showed a cupping of the surface of the dentin, the enamel margins standing higher, and also a gold filling in the fissure wearing down equally with the enamel. In the latter just the opposite condition was produced, the enamel wearing down much more rapidly, the dentin and an amalgam filling standing high above the surface of the enamel.

Experiment 8. The same experiment was repeated, with the addition of two small blocks of ivory in each case. The same conditions resulted in the teeth, while the blocks of ivory subjected to the action of the pumice in water showed much more wearing than did those with pumice in the 10 per cent. solution of hydrochloric acid.

Experiment 9. Five teeth—canine, two bicuspids, and two molars—numbered 1 to 5.

FIG. 25.



Action of 10 per cent. hydrochloric acid in conjunction with friction.

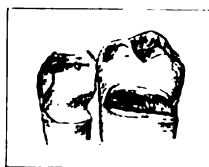
under the action of 10 per cent. hydrochloric acid on cotton for $9\frac{1}{2}$ hours, brushed every half-hour for five minutes with an English tooth-paste, then under 10 per cent. phosphoric acid for 23 hours, brushed half-hourly for seven minutes. Nos. 3, 4, and 5 are cut deeply, opening the pulp-chamber; Nos. 1 and 2 being less affected. The destruction in the case of the first molar involves the whole buccal surface and part of the morsal surface; in the other teeth the amount of wearing is in the order 4, 3, 5, 2, 1. All are highly polished. (Fig. 25.)

Experiment 10. Three teeth, numbered 1, 2, 3. No. 2, with a gold filling, was subjected to a 10 per cent. solution of hydrochloric acid on cotton for $7\frac{1}{2}$ hours, and brushed every quarter hour for five minutes with pumice; then for $9\frac{1}{2}$ hours and brushed every one-quarter hour for two minutes. Preponderance of mechanical action. The pulp-chambers are opened by large wedge-shaped incisions which extend on the buccal surface half-way to the morsal margin. The gold filling was polished and rounded off at the edges, but still slightly *higher than the surface of the enamel* (evidence of acid action). All surfaces are fairly polished.

Experiment 11. Two teeth, molar and canine, were treated for 17 days with 2 per cent. solution of oxalic acid and brushed twice daily one-half minute with pumice; then for $55\frac{1}{2}$ hours with 5 per cent., brushed for three-quarters of a minute quarter-hourly; then for 18 hours brushed three-quarters of a minute half-hourly. The molar has a wedge-shaped defect at the neck involving half of the buccal surface, while the enamel on the labial surface of the canine is totally destroyed and a strikingly typical cavity formed. This cavity developed very rapidly during the last three days. The margins of the canine especially are sharp, and the dentin is deeply hollowed out. Both cavities have a high polish. (Fig. 26.)

Experiment 12. Five teeth in plaster, one with a gold filling, bathed for 8 hours with 1 per cent. hydrochloric acid on cotton, brushed hourly for five minutes with 5 per cent. pumice, then for 13 hours brushed two minutes hourly, then for $18\frac{1}{2}$ hours brushed

FIG. 26.



Action of oxalic acid in conjunction with friction.

two minutes half-hourly and for 78 hours one minute half-hourly. Extensive defects were produced at the necks and extending upon the enamel surfaces, in one case following along the disto-labial margin of an incisor to the cutting edge, giving a perfect and beautiful reproduction of a typical case of wasting. The gold filling was evidently worn, but was standing higher than the surface of

the dentin (mechanical action). All surfaces are well polished. The enamel shows characteristic markings; the margins of defects are fairly sharp.

Experiment 13. Four teeth bathed in the manner described in a 5 per cent. solution of tartaric acid on cotton for 37 days, brushed the first 28 days four times daily for one minute, for the remaining days five times daily. The margins of the cavities are sharp, and the surface highly polished. Close examination will also show that the enamel plate has been considerably thinned down.

Experiment 14. Four teeth numbered 1, 2, 3, 4, treated for 11 days with 5 per cent. citric acid and brushed four times daily for one minute with an English tooth-paste, then for 19 days with 1 per cent. and brushed twice daily. Bright shallow facets are present at the necks of all of the teeth, reaching in No. 2 half-way to the margin of the morsal surface; in Nos. 1, 3 and 4 they are less extended. The margins are sharp, the surface of the enamel perfectly smooth and bright in No. 3, but slightly roughened and showing chalky streaks in Nos. 1, 2, and 4. The enamel striæ are distinctly visible in Nos. 1, 2, and 4, indistinctly in No. 3.

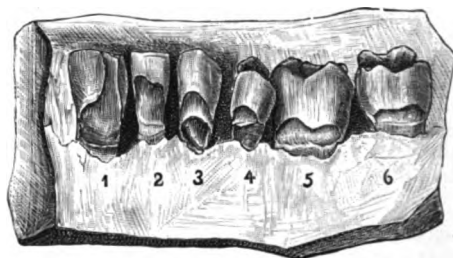
Experiment 15. Four teeth, numbered 1 (canine), 2 (bicuspid), 3, 4 (molars)—No. 3 filled with gold—were treated with 5 per cent. hydrochloric acid for 9½ hours, brushed half-hourly for five minutes, for 11 hours hourly for two minutes, for 41 hours half-hourly two minutes, with pumice. The cavities are all shallower than those produced by the same application of the brush without acid; they are well polished, with fair margins. In No. 1 the cavity is divided by two diverging ridges into three sections. The polished enamel shows no evidence of wear, yet it has been worn down very considerably and the gold filling stands at least ¼ mm. higher than the surface of the enamel (unmistakable evidence of acid action). The enamel striæ are faint.

Experiment 16. Four teeth numbered 1 (bicuspid), 2 (canine), 3 (molar), 4 (canine), treated with 5 per cent. oxalic acid for 32 hours, brushed quarter-hourly for ten seconds with 10 per cent. pumice, then for 47½ hours brushed quarter-hourly for twenty-five seconds, and for 7 hours brushed quarter-hourly for forty-five seconds. Comparatively shallow extensive cavities were produced, involving in Nos. 1 and 3 nearly the whole of the buccal surface. The surface of the cavities is traversed by numerous ridges. Margins are not very sharp; there is a distinct wearing down of the remaining enamel; the

surface is fairly polished, but under the magnifier presents a pitted appearance, with striæ faint or invisible.

Experiment 17. Six teeth—central, lateral, canine, bicuspid, first and second molars—placed in a curve to reproduce the natural arch, were bathed with 5 per cent. phosphoric acid for 13 hours, brushed hourly for two minutes with 50 per cent. pumice; then for 11 hours brushed hourly three minutes.

FIG. 27.



Beautiful case of wasting (chemico-abrasion) produced by the action of phosphoric acid in conjunction with friction applied horizontally; 3. gold; 4. gutta-percha filling.

and for 73 hours four minutes hourly. In No. 1 is seen a beautiful case of wasting, beginning at the neck and extending along the disto-labial margin to the cutting edge (Fig. 27), and then spreading laterally. No. 3 was filled with gold, No. 4 with gutta-percha at the neck. Both of the fillings stand higher than the surrounding dentin. The enamel of all the teeth is very thin; the polish fair, that of the dentin high. The cavities at the neck are not so deep as would be produced in the same time without the action of acid. Striæ are distinctly visible under glass. Duration of experiment 97 hours; total amount of brushing 6 hours.

Experiment 18. The teeth of the right half of a mandible were treated separately from the third molar forward with 5 per cent. solutions of hydrochloric, phosphoric, oxalic, lactic, and sulfuric acids, and water, all brushed alike with 10 per cent. pumice powder for one minute half-hourly. In 19 days the enamel of No. 1 was completely destroyed, the dentin being softened to a depth of 1 mm. or more, but with no wearing. Nos. 2 and 3 have shallow, brightly polished cavities at the neck and extending upon the enamel about half-way to the morsal margin. The enamel surface is polished, but presents a pitted appearance and is considerably worn down. No. 4 presents similar changes except

that the pitted appearance of the enamel is wanting and there is a soft (decalcified) spot in the center of the cavity, where the wearing away is evidently being retarded. No. 5 is similar to No. 4, but shows only a trace of softening at two very small points. In No. 6, treated with water, the enamel is but very slightly affected, the highly polished cavity being restricted to the neck of the tooth.

Experiments 19-22. Twenty teeth were mounted in plaster of Paris in four rows of five teeth each. In the first row (experiment 19) the teeth were treated separately, No. 1 with 10 per cent., No. 2 with 5 per cent., No. 3 with 2 per cent., No. 4 with 1 per cent. hydrochloric acid, and No. 5 with water. All were brushed alike for one minute half-hourly with a rubber brush without powder. In 16 days the enamel plate of No. 1 was completely gone, the dentin softened, and a filling of amalgam projected above the surface by the thickness of the enamel. No. 2: Filling of phosphate cement partially washed out, cervical portion of enamel gone and dentin

FIG. 28.



[Described in text.]

softened; the remaining portion has a chalky surface. No. 3: Same changes in less degree, the gold filling projecting above the surface of the enamel. In No. 4 the enamel is nowhere broken through; it has, however, been reduced in thickness, the filling of gutta-percha standing higher than the surface of the tooth. The enamel has a slight polish in the central parts, surrounded by chalky margins. No. 5 shows no change. In the second row (experiment 20) the arrangement was the same, except that phosphoric acid was used instead of hydrochloric, and the teeth were brushed with a soft bristle brush with 10 per cent. pumice. The teeth were filled, in order, with gold, gutta-percha, gold, amalgam, and cement. The action of the acid is less and that of the brush more pronounced throughout.

After 16 days we find the enamel plate of No. 1 destroyed and the dentin decalcified. There is considerable loss of substance at the neck of the tooth notwithstanding the decalcification. In Nos. 2 and 3 we have a mixture of decalcification and abrasion, in No. 4 almost pure abrasion, there being only a small spot of softened dentin on the margin of the filling. From this we see that under the action of a 1 per cent. solution of phosphoric acid a tooth must be brushed for at least one minute half-hourly with 10 per cent. pumice to maintain a polished surface. In No. 5 we have pure abrasion. The enamel surface in No. 2 lacks the normal polish. Nos. 3 and 4 are fairly, and No. 5 highly polished. (Fig. 28.)

In the third row (experiment 21) the disposition was just the same as in the second. The teeth were filled with cement, gold, gutta-percha, amalgam, and gold in succession, and brushed half-hourly for two minutes with a hard brush with 10 per cent. pumice. In No. 1 two-thirds of the enamel plate is destroyed and the underlying dentin softened; no apparent wear except at the neck. In Nos. 2 and 3 the teeth are badly cut, but, in both, traces of soft dentin are present; the enamel surfaces lack their normal polish; the fillings stand slightly above the enamel surface (a sure sign of excessive chemical action). In No. 4 we have the appearance of pure abrasion; the surfaces are highly polished, and the amalgam is worn down below the level of the enamel. In No. 5 the wear is most intense and the gold lies slightly lower than the surface of the enamel. In No. 4 a narrow groove is worn between the filling and the enamel margin. In No. 5 this groove is wanting.

In the fourth row (experiment 22) the teeth—filled with gutta-percha, gold, amalgam, amalgam, gold—were treated respectively with phosphoric acid of 5, 3, 2, and 1 per cent. and water, and brushed half-hourly for two minutes with a hard brush and pure pumice. Here the mechanical action predominates, and the cutting at the neck increases from No. 1 to No. 5. A narrow zone of enamel around the filling in No. 1 is destroyed and the dentin decalcified; the enamel surface shows the action of the acid. In No. 2 the filling has fallen out, in Nos. 3 and 4 the fillings lie far below the surface of the enamel (denoting the preponderance of mechanical action), and slightly above that of the dentin. The enamel of Nos. 2, 3, and 4 is fairly polished, but lacks the brilliancy of No. 5. The gold in No. 5 is slightly lower than the enamel surface. In nearly all of the experiments the enamel striæ are more distinct in the teeth acted upon by acid. This is, however,

not always the case, and can therefore not be made use of as a means of diagnosis.

Experiment 23. Two teeth suspended by a string in a concentrated solution of mucic acid, brushed twice daily for 6 weeks, (a) with 10 per cent. pumice, (b) without powder. A slight loss of substance was produced at the necks of both teeth, especially a. Enamel surface of a is pitted, that of b smooth.

These, and many other experiments not here recorded (over two hundred in all were made), confirm the conclusion arrived at under division II, that acids alone can never produce wasting. On the other hand, however, wasting of the enamel is materially accelerated by the action of acids, and I had no difficulty in producing cases as typical as any which may be met with in the human mouth. It is only requisite that the mechanical action be in a definite ratio to the chemical, otherwise we get a rough surface with whitish chalky margins on drying, and the typical character is wanting. In the case of the dentin the results were different, and it appears here that nothing is gained by the action of the acid. Experiments on ivory, as well as on human dentin, repeated time and again, have shown that dentin which has been decalcified by the action of an acid is less susceptible to wear under the brush than normal dentin. This result does not surprise us, since we know very well that brittle substances grind away more rapidly than soft tough ones. We might grind for hours on a piece of rubber tubing without grinding it away to any great extent, and every dental histologist knows that carious (decalcified) dentin resists the action of the stone longer than either normal dentin or enamel. We are consequently forced to the conclusion that the wasting of the dentin is not accelerated by the action of the acid; it may, with the exceptions given below, even be retarded or completely prevented by it. We can ordinarily have wasting of the dentin in the presence of an acid reaction only when the mechanical action is so strong that it wears away the dentin in spite of the decalcification. As a rule, any considerable

acid reaction at the neck of the tooth results in caries and not wasting; or we may have both occurring side by side; or caries may follow upon wasting through a change in the habit of brushing, or when the gums grow partially over the erosion cavity, thus preventing the further action of the brush and furnishing a lodging-place for the food.

Notice that in all of the experiments the mechanical action was made to correspond in intensity to the chemical, and that in all cases where the effects characteristic of wasting were produced it was necessary to bring a preponderance of mechanical action into play. Take, for example, the tooth No. 4 in Fig. 28 (experiment 20), where the brushing has just barely sufficed to keep pace with the decalcification. One minute half-hourly, or forty-eight minutes daily, represents a friction more than one hundred times that which the individual tooth ordinarily receives, whereas the strength of the acid employed is not more than twenty-five to fifty times what it would require to be in the mouth to have any action at all.

I have frequently asked myself the question whether the brushing and the amount of tooth-powder employed in producing the effects which I have described may not represent a greater amount of friction than is usually produced in cleaning the teeth. I do not feel at all sure, however, that such is the case, as I have taken particular pains that no more force should be exerted than in brushing the teeth in the mouth. We have a certain measure of the friction produced in the wearing of the brushes and in the amount of powder used.

In the case shown in Fig. 19, two boxes of tooth-paste were used and two brushes worn down, to produce a result which might represent the work of ten to forty years in the mouth, during which time on a very moderate estimate at least twenty to one hundred boxes of paste and five to twenty tooth-brushes would be used up.

With respect to the retarding influence of acids on wasting of the dentin, it depends very materially upon the nature of the acid. Those acids which rapidly

decalcify (soften) the dentin, of which we may take hydrochloric and lactic as types, most readily retard the wearing away by friction; while those which act slowly on the dentin (oxalic, tartaric, etc.), as well as those which have a macerating effect on decalcified dentin, may be wanting in this influence. (See under division IV.)

The very important question here arises as to whether the friction of the lips and cheeks in talking and eating is sufficient to represent the necessary me-

tells us this, since we know that where veritable decalcification of either the labial or buccal surface takes place, the decalcified tissue is never rubbed away by friction of soft tissues or of the food. It may be barely possible in the case of races that live on roots, edible earth, etc.

Therefore I am of the opinion that among civilized races, in order to produce wasting of the enamel through the agency of acids, there must be some mechanical factor in operation beyond that which is naturally present in the mouth;

FIG. 29.



Action of acid calcium phosphate in conjunction with friction during two and one-third years.

FIG. 30.



Friction in conjunction with water during two and one-third years.

chanical factor in the production of wasting. A study of the large amount of experimental material at my disposition has led me to the conclusion that under ordinary circumstances it is not. It certainly is not so in the case of the dentin, and although the decalcified enamel yields more readily to friction than the decalcified dentin, still I have found—especially where the process of decalcification is carried on very slowly, as it must be in the mouth—that a considerable amount of friction with the brush is necessary, otherwise we will find on drying the tooth with warm air that the surface has a chalky, opaque appearance.

Hence, I infer that even in the case of the enamel, the mechanical action must be more considerable than that which is produced by the friction of the mucous membrane. Our clinical experience also

and that in the case of the dentin, unless this factor is fairly strong, the action of the acid will result only in softening and decay. I fully recognize the potency of acids in accelerating the progress of wasting as far as the enamel is concerned; given the acid and the necessary mechanical factor acting together, the process will spread upon and through the enamel much more quickly than where only the mechanical factor is in operation. This is well illustrated by the following experiment:

In a mandible, the teeth of the left side were treated with a $\frac{1}{2}$ to 1 per cent. solution of acid calcium phosphate applied on cotton. The right side was treated in like manner with water, both sides being brushed twice a day with different powders for two and one-third years.

It will be seen by the photographs (Figs. 29 and 30) that the destruction of the enamel

is much more extensive on the left side (Fig. 29) than on the right (Fig 30). The brushing was begun one month later on the right side, but this in a period of twenty-eight months is a negligible quantity.

WHICH ARE THE ACIDS THAT MAY BE CONCERNED IN WASTING?

From the results of the experiments recorded above under divisions II and III, I think we can draw no other conclusion than that *any acid or acid salt which possesses the power of extracting the calcium salts from the enamel, or of breaking up the connection between the enamel prisms, may accelerate the process of wasting*, provided the necessary mechanical factor works together with it. Furthermore, any acid or acid vapor which is sufficiently powerful to disintegrate the organic basis substance

of the dentin may cause wasting, with a minimum of mechanical action.

It is, however, altogether a different question whether acids actually play an important rôle in the process of wasting as met with in the mouths of our patients, and certainly the mere fact that litmus paper shows the saliva to have an acid reaction at any particular time does not of itself justify the conclusion that the cause of the wasting has been discovered. American writers on this subject, as a rule, state that the reaction of the oral fluids is acid in cases of wasting. Others pronounce the reaction to be alkaline; for example, Dill and Preiswerk (*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, April 1903, pp. 126, 127). A similar view is expressed by Hintz, although he does not give the grounds on which his view is based.

(To be continued.)

A STUDY OF THE VASCULAR LESIONS OF THE DENTAL PULP, THEIR COMPLICATIONS AND CLINICAL SIGNIFICANCE.

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THERE are probably no other organs of the human economy which have a greater number of interesting and unique features than the teeth. This is true in many ways—anatomically, physiologically, and pathologically. And it is doubtful whether, in these latter days of scientific expansion and investigation, as much is absolutely known about them as has been discovered, for example, about the cerebro-spinal system, with its gross and minute anatomy, its varied functions, and its disease conditions. Controversy still occupies itself with such questions as the real nature and structure of the enamel and its method of formation, and the exact terminations of the non-medullated nerve fibers in the pulp; while the arrangement and course of distribution of the bloodvessels and nerve

fasciculi of the peridental membrane are quite obscure. There are many subjects of inquiry which as yet are unexhausted.

Of all the different tissues that go to form the component parts of a tooth, the pulp is the most interesting. It is likewise the most important, for on its vascular and nervous mechanism depends the vitality and therefore the utility of each unit of the masticatory apparatus. The strikingly singular character of the anatomical distribution of the vascular supply arrests attention, and the impartial observer who might be suddenly called upon to study fully and critically the diseases of the pulp as an entirely new field for his own exploitation would probably note that fact at the commencement of his laboratory experiments and experience.

ANATOMICAL CONSIDERATIONS.

Two facts stand out pre-eminently as being of great significance—(1) the absence of a collateral circulation in the pulp itself, and (2) the non-valvular character of the veins, which at the same time are non-collapsible.

(1) With regard to the former, it may be recalled that during the development of the teeth the tissues formed from each layer of the primitive blastoderm are supplied by two separate groups of vessels, of which the internal set, distributed to the mesoblastic structures, vascularize the dentin papilla, the dental sac, and the surrounding bone. In adolescent and adult pulps the branches of the internal set enter the apical foramina of the teeth usually as a single trunk, which may measure as much as 83 microns in width, to become almost immediately bifurcated and divided into many subsidiary branches, ending near the basal layer of Weil in an anastomosis of capillary loops whose individual lumina are roughly, on the average, about 8 microns in diameter.

If the lumen of the main artery, entering the apical foramen, is by any means occluded, the integrity of the whole of the vascular system is imperiled, as there are no collateral branches to restore the balance in the blood-stream. This actual condition is almost if not quite unique in the general anatomy of the body, though three parallels may be cited, viz. the absence of a collateral circulation in the terminal vessels of the brain, in the arteria centralis retinae of the eye, and in a lesser degree also in the walls of the heart.

These remarks apply with no element of uncertainty to the vascular system of the single-rooted teeth. It cannot, however, be asserted with equal confidence that the pulps of molars have no collateral circulation. The exact method of distribution in these larger teeth has never been ascertained, owing to the difficulties encompassing the performance of an artificial injection of the vessels in adult age. But clinically it would seem to be impossible for a collateral anastomosis to exist; and from an embryolo-

logical point of view the statement of Lepkowski¹ may most probably be relied upon. This observer shows (*Anatomischer Hefte*, 1901) that "In the germ of the two-cusped tooth there are present two bundles of vessels separated from one another," etc.

(2) Again, on account of the patency and non-valvular character of the veins it may be assumed that exogenetic influences in normal circumstances cannot affect the flow of blood in the pulp. The veins are not subjected to muscular or other external pressure, and in this respect agree with other similarly constructed tubes, such as the superior and inferior vena cava, the pulmonary veins, and those in the interior of the cranium and vertebral column, and long and short bones.

Hence it is observed that these two facts are conspicuously apparent, the first being probably of the greater importance, as the general systemic veins that are 2 mm. and less in diameter are unprovided with valves. But the significance of the absence of a collateral circulation on the causation of diseases of the pulp cannot be overestimated by the perspicacious and discriminating student.

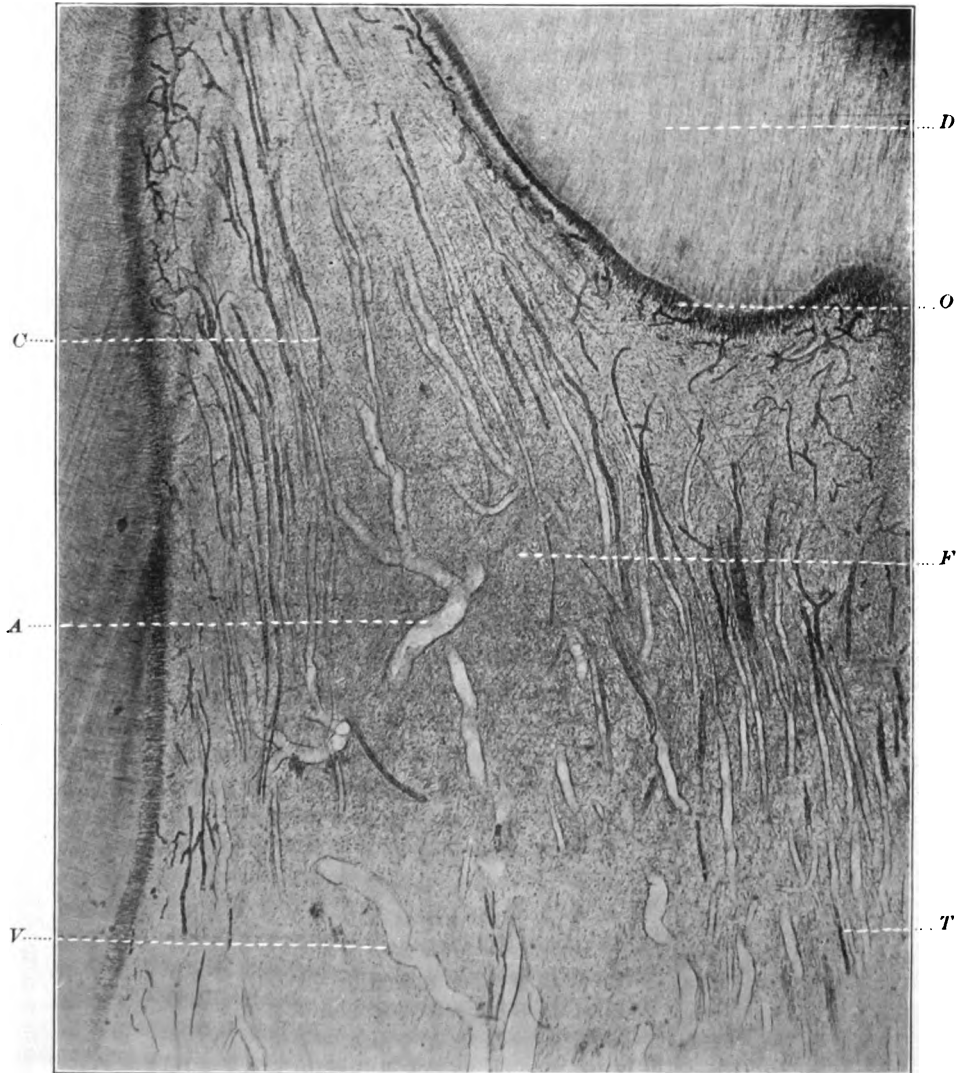
GENERAL EFFECTS.

After due consideration of these anatomical conditions it is not a matter for surprise that lesions or degenerations arising from variations in the blood current or in the blood pressure in the dental pulp should be fairly common. So much is this the case that one would probably be not far from the truth in asserting that while teeth are so very frequently the victims of dental caries, they may also equally and simultaneously be subjected to internal retrogressive changes induced by a lowered or altered physiological resistance on the part of the pulp, through the unusual characteristics of its blood supply. This does not apply entirely to the normal individual, but more especially to those persons who suffer from disturbances of the circulatory systems.

It is well known that many persons

undergo a certain temporary discomfort For some reason or other the vessels be-
brought about by hyperemia of the pulp. come vicariously over-filled and undergo

FIG. 1.



Longitudinal coronal section of premolar with pulp *in situ*, showing thrombosis of capillaries and other vascular lesions. Prepared by the author's process; stained with Ehrlich's acid hematoxylin. (Magnified 45 diameters.) A, Branch of main artery. V, Enlarged vein. C, Capillary filled with thrombus. T, Thrombus becoming organized. F, Early stage of fibrification of pulp tissue proper. O, Odontoblast layer increased in width and in the number of its cells.

hydrostatic congestion, which presently disappears when the cause is removed or when there is a good outlet provided for a free flow. If, however, the intradental pressure is so severe as to prevent the occurrence of an efficient and quick relief, then the tissues degenerate and perhaps die, as they are unable, on account of their dentinal environment, to accommodate themselves to their engorged state.

Dr. Ferdinand Tänzer of Trieste², in an instructive paper, has recently emphasized this point. He there records a case—among others—where, on account of the circulatory irregularities in the internal genital organs and adnexa of a patient, the pulp of a tooth died as the result of the abnormally-increased intradental blood pressure. The introduction of metal fillings and cement floorings into carious cavities is sometimes followed ultimately by local pain, and the work of obturation is credited by the uninformed with being the cause of the odontalgia, while it is merely often due to either reflex nervous irritation or a rise in the local blood pressure. The author just quoted proceeds to summarize his remarks by saying that this increased intradental blood pressure may arise as a consequence of diseases due to circulatory deflections from the normal, to conditions of high nervous tension as in hysteria, to influenza, pregnancy, or occasionally as the result of traumatism.

It is thus clear that temporary engorgement of the vessels in the pulp tends to produce odontalgia of varying degrees of severity; but if this congestion be continued it leads eventually to death of the parts and cessation of pain. This may be brought about (a) slowly, when the tissues pass through the various stages of fibroid degeneration, or (b) rapidly, when moist gangrene supervenes as a result of thrombosis, and arterio-sclerosis and sudden death *en masse* takes place.

It is believed that slight rise of blood pressure produces no symptoms of neuralgia, though it can be readily conceded that nerve pain from other areas may be reflected to a tooth which is sound but whose pulp is somewhat hyperemic. For

instance, the effect produced by pressure on the supra-orbital branch of the ophthalmic division of the fifth nerve occasioned by wearing a tightly fitting hat or forage cap may be to induce pain in a maxillary canine whose pulp is hyperemic—which pain disappears at once on removal of the cause of pressure.

At the time that Dr. Henry Head³ wrote his remarkable observations on "Disturbances of Sensation, with Especial Reference to the Pain of Visceral Disease," and drew attention to certain well-defined areas of superficial tenderness of the skin, the study of the vascular lesions of the pulp had not been undertaken. His investigations were solely concerned with carious teeth, and showed that "As long as the pulp-cavity is not exposed the pain remains local. The patient will complain of an aching tooth and will point to the one affected." Local stimulation produces local pain (odontalgia), and "is exactly analogous to that produced by injuries to the conjunctiva or outer layers of the cornea." When, however, the pulp is exposed the pain alters in character and distribution (neuralgia). "It starts in the affected tooth, and darts or shoots into the face, forehead, neck, or ear." (Page 407.) It is practically certain that, today, increased intradental blood pressure in sound teeth would be added to Dr. Head's previous classification.

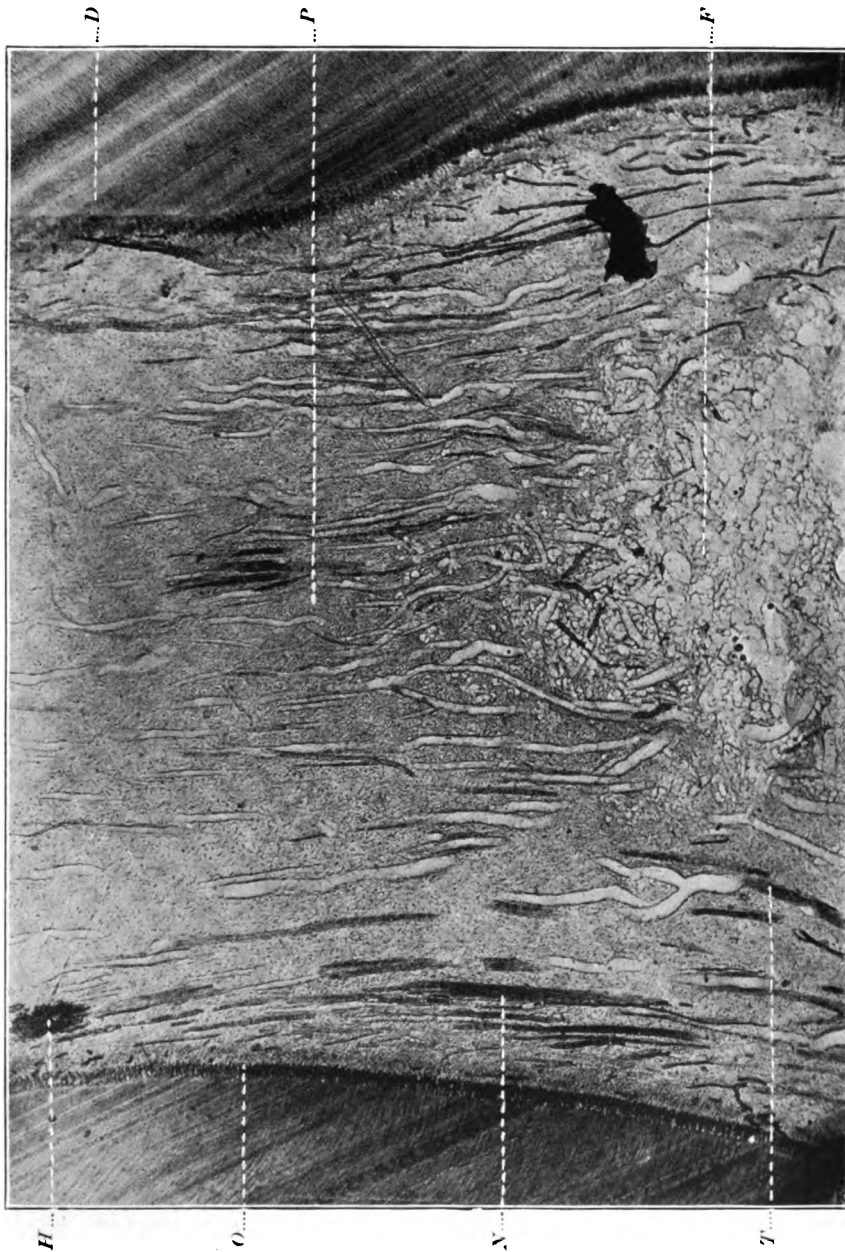
Fortunately, gangrene as a permanent termination of thrombosis is a contingency of comparatively infrequent occurrence from a clinical point of view, and it is with certain atrophic changes, slowly produced, that the writer desires to deal in the present communication.

Some years ago the author published an account of that common lesion of the pulp which is today spoken of as fibroid degeneration or reticular atrophy. An article from his pen was printed in March 1892 in the *Journal of the British Dental Association*, in which was described the ultimate phase of this degeneration. The pathological steps leading up to it had not, at that time, been investigated, and its etiology was not thoroughly elucidated. The opinion

was, however, expressed that it represented "the natural and usual termina-

he has enlarged his views on the subject. for he believes that the senility of the

FIG. 2.



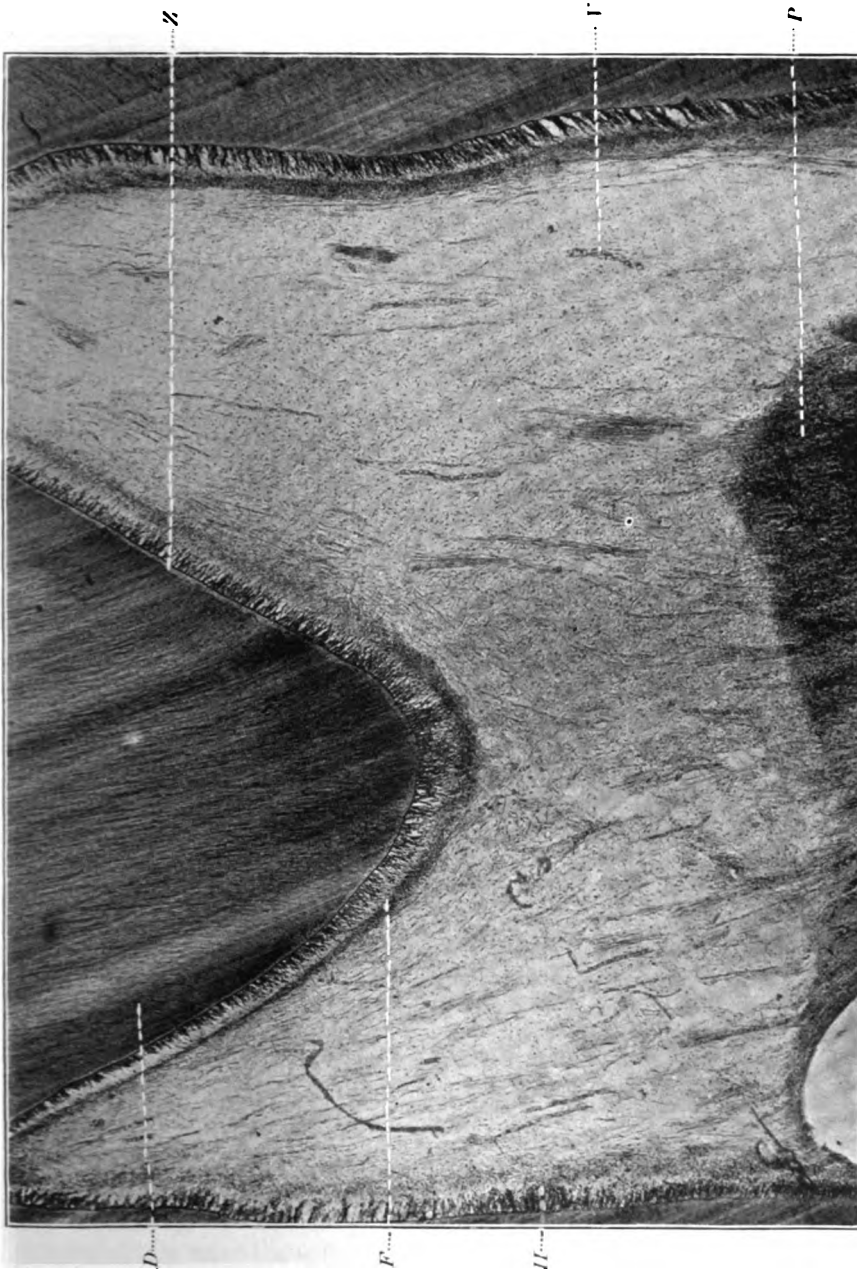
Similar to the preceding, through the cervical region of the pulp, showing transitional stages through which pulp passes. (Magnified 45 diameters.) *P*, Pulp tissue passing from the fairly normal condition to a state of fibrification and reticulation. *F*, Fibroid degeneration nearly completed. *T*, Thrombosed capillary. *N*, Degenerated bundle of nerves. *H*, Hemorrhagic infarct. *O*, Odontoblasts. *D*, Dentin.

tion of the life-history of the dental pulp" occurring in aged teeth. The writer still holds this opinion, although

pulp does not at all depend upon its age. Children may at times possess senile pulps, in the same way that the eyes of

young persons often exhibit the arcus senilis of the cornea. Many of the spec- irregularities in position of the teeth, and many show that the whole of the

FIG. 3.



Coronal section through pulp of premolar showing probably one of the earliest phases of fibrosis. (Magnified 45 diameters.) *D*, Dentin. *Z*, Zone of formed but not completely calcified dentin. *F*, Fibrification of pulp tissue, showing apparently a mutual relationship between length of odontoblasts and thickness of the band of fibrification. *P*, Large area of fibrification and condensation of tissue fibers and cells in body of pulp. *V*, Bloodvessels containing corpuscles but no thrombus. *H*, Small hemorrhage among odontoblasts.

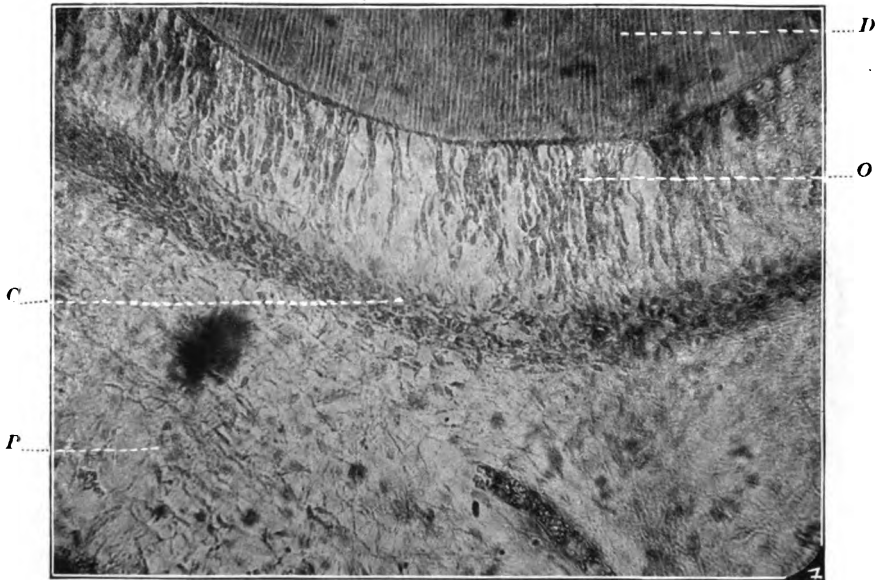
mens examined for the purpose of these notes were removed for the treatment of

dental wall was not completely calcified.

Material having been meanwhile forthcoming, and sections prepared, he is now able to give an outline of the probably vascular and other lesions which combine to bring about this state, parenthetically noting that the same or similar degenerations have been seen and described by Black⁵, Walkhoff⁶, Wedl⁷, Rothmann⁸, etc.

fibers of the parts occur. "Sheaving" of the odontoblasts, with or without fatty degeneration, permanent distension of the arteries and arterioles, and rapid development of overgrowth of the fibroid tissue supervene until a well-marked reticular atrophy appears, and in later stages complete fibrosis of the organ, with disappearance of all cells and nuclei.

FIG. 4.



Details of early fibrification of pulp tissue. (Magnified 250 diameters.)

D, Dentin. *O*, Odontoblasts. *C*, Condensation of pulp tissue. *P*, Early fibrosis.

Probably this fibrosis or sclerosis is due, as a complication, in the first place to thrombosis of the capillaries and veins, and permanent dilatation through loss of tone (due to impairment of the vasomotor mechanism) or disease of the walls of the arteries, with or without tiny hemorrhages. This seems often to be succeeded or accompanied by a condensation or fibrification of the pulp tissue which lies between the basal layer of Weil and the substance of the pulp proper. A hyperplasia of the connective tissue

and every vestige of nerve bundle and vascular system.

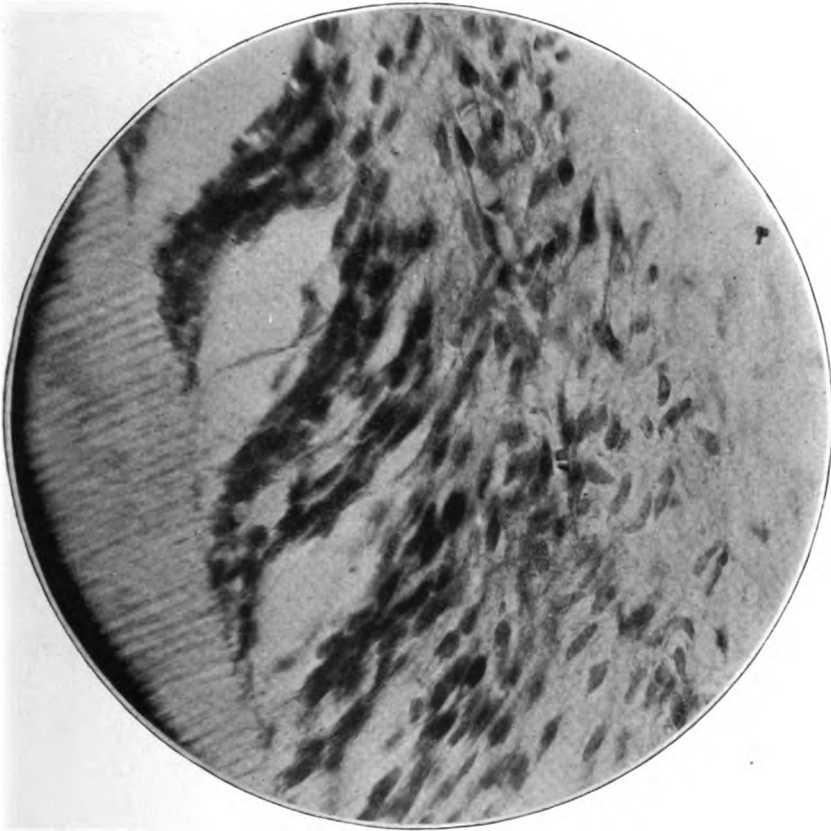
PATHO-HISTOLOGY.

Longitudinal coronal sections of the pulps show to the best advantage these changes. (Figs. 1, 2, and 3.) The capillaries and small veins which are distributed to the peripheral parts are engorged. Very few are empty and none are stenosed. Under low powers of the microscope they present themselves as

dark long strands running for the most part in the vertical axis of the tooth. The corpuscles and blood platelets which they contain are appreciably altered in shape and size—due, no doubt, partly to post-mortem changes, partly to the histologi-

from their walls as a consequence of rupture. Small arterial cauliflower-like hemorrhages are seen frequently, at times among the odontoblasts, at times in the basal layer of Weil, and again at times in the substance of the

FIG. 5.



Degeneration of odontoblasts. (Magnified 500 diameters.)

cal reagents employed—as these have not been specially directed to the preservation and staining of the blood elements—and partly also to those hemic changes which favor coagulation, to be presently described. They may partially or completely fill the lumina of the vessels, and are sometimes arranged in rouleaux; but in addition have in places escaped

pulp itself. The hemorrhagic infarcts may vary in constitution from a punctiform collection of a dozen or more corpuscles to a large mass, as in the photomicrographs. (Figs. 8, 9, and 10.) The endothelium of the tunica intima of these arteries and capillaries is altered, and the nuclei of its cells are indistinguishable. The larger arteries and larger veins are

FIG. 6.

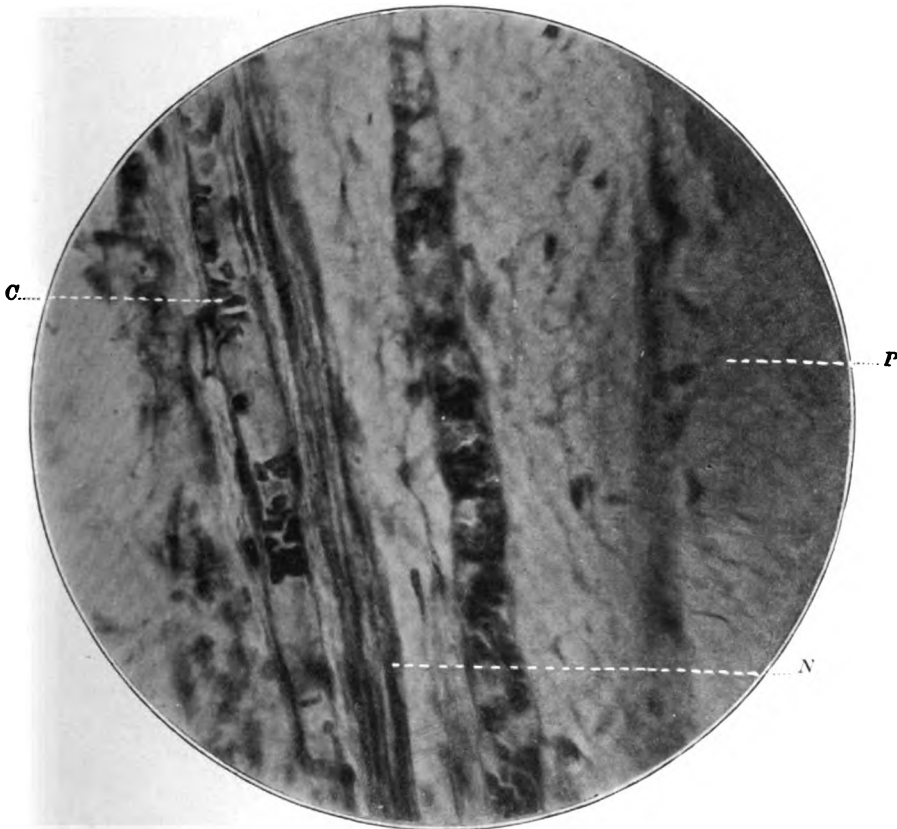


Similar to Fig. 1, showing a later stage of fibrosis of the pulp. (Magnified 45 diameters.) *D*, Dentin. *O*, Odontoblasts increased in number. *A*, Arteriole. *H*, Hemorrhagic infarct. *F*, Fibrosis of pulp.

empty, as exemplified in Fig. 12, and hyaline areas of degenerated material in many places extend across them, and as they become smaller occlude their lumina. The arteries have lost their

stances the odontoblasts, which are largely increased in numbers, are vacuolated (Fig. 14, *O*), the flat globules being often situated at their basal extremities, very numerous, and very small as a rule,

FIG. 7.



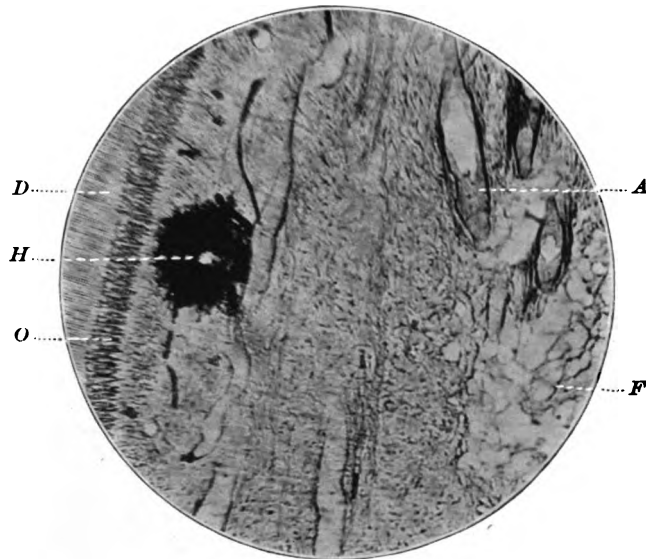
Details of bloodvessels. (Magnified 500 diameters.) *C*, Corpuscles adherent to vessel walls. *N*, Nerve bundles. *P*, Degenerated pulp tissue.

distinguishing coats, and so have the veins, both classes of vessels having thinner walls than usual—a condition which pathologists would probably designate as hypoplasia or hyaline degeneration. (Fig. 15.)

The morphological effects of these vascular lesions on the surrounding soft parts is very noticeable. In some in-

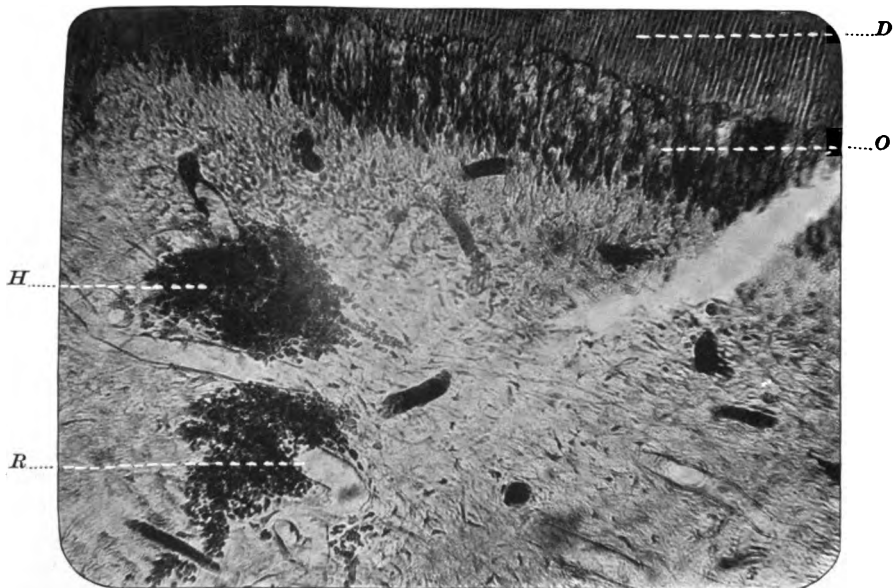
stances the odontoblasts, which are flattened laterally, and their nuclei are planiform. They are gathered together into bundles or sheaves. (Fig. 5.) The “sheaving” of the odontoblasts is of very common occurrence. It has been noticed by other writers, particularly by Walkhoff, who gives photomicrographs of

FIG. 8.



Pulp *in situ*. (Magnified 250 diameters.) *H*, Hemorrhage near basal layer of Weil. *O*, Odontoblasts. *D*, Dentin. *A*, Hyaline plug in small artery. *F*, Fibroid pulp.

FIG. 9.



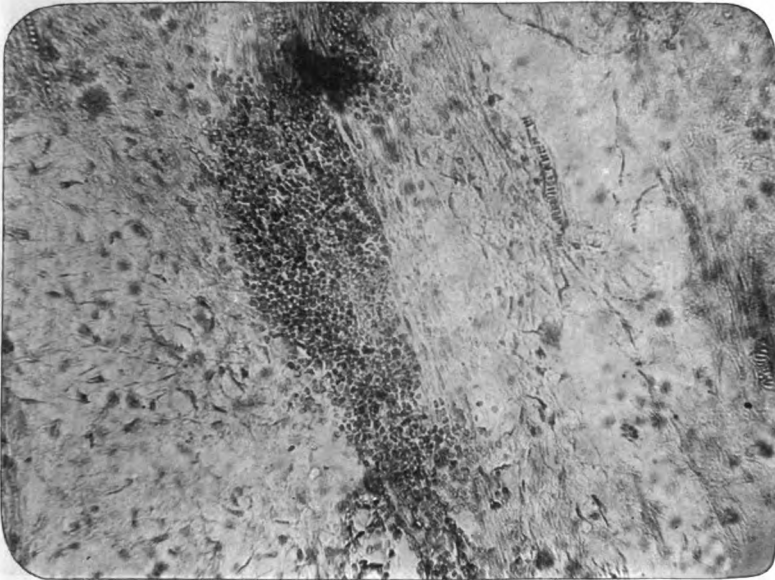
Similar to preceding (same magnification). *H*, Hemorrhagic infarct. *R*, Ruptured artery whence blood corpuscles have escaped. *D*, Dentin. *O*, Odontoblasts.

FIG. 10.



Similar to preceding (same magnification), showing hemorrhagic infarct.

FIG. 11.

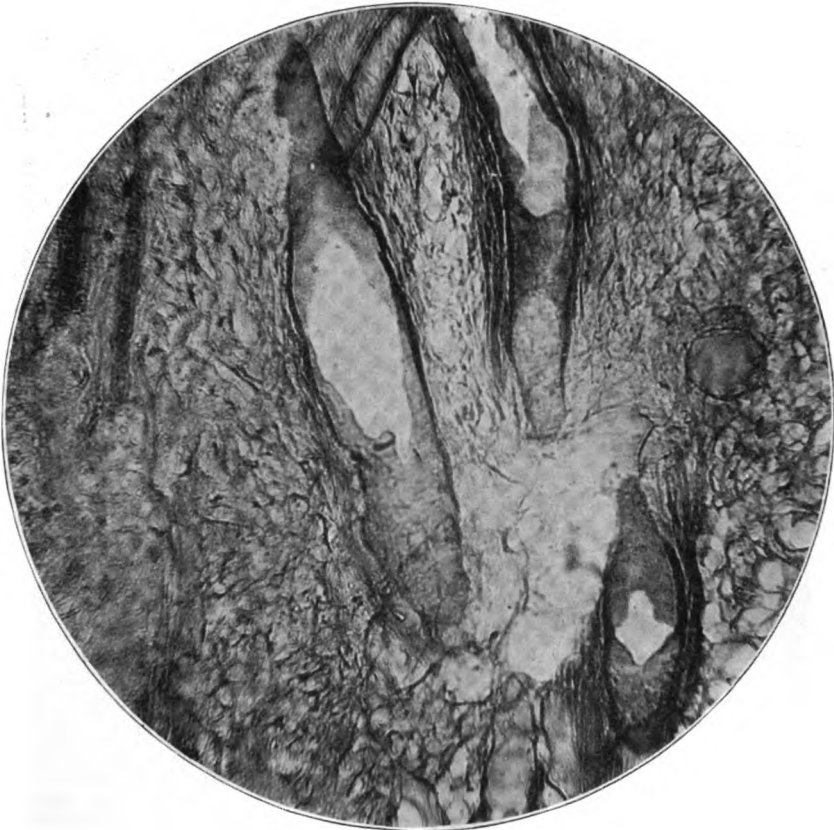


Similar to preceding (same magnification), showing hemorrhagic infarct in center of pulp tissue.

it in his "Atlas of the Pathological Histology of the Human Teeth," F. J. Bennett^o, etc. The basal layer of Weil is curiously rich in small cells which have large round nuclei, and perhaps somewhat diminished in width, while its

and chemical changes in the protoplasm of the cells. When nerve bundles are visible they appear to be degenerated also, and for the time being usually stain badly as long, thin, dark threads running alongside the vessels.

FIG. 12.



Hyaline degeneration of bloodvessels. (Magnified 300 diameters.)

fibrous components are rendered more prominent and tough.

The cells of the pulp proper possess nuclei which are degenerate in shape and small in size; their branches are increased in number and extremely well marked. Here and there, in varying degrees of intensity, there seems to be a thickening of the intercellular cementing substances

Organization of the thrombi is observed to be proceeding in places, leaving only a thin fibrous cord or hyaline plug coherent to the walls or completely filling it up.

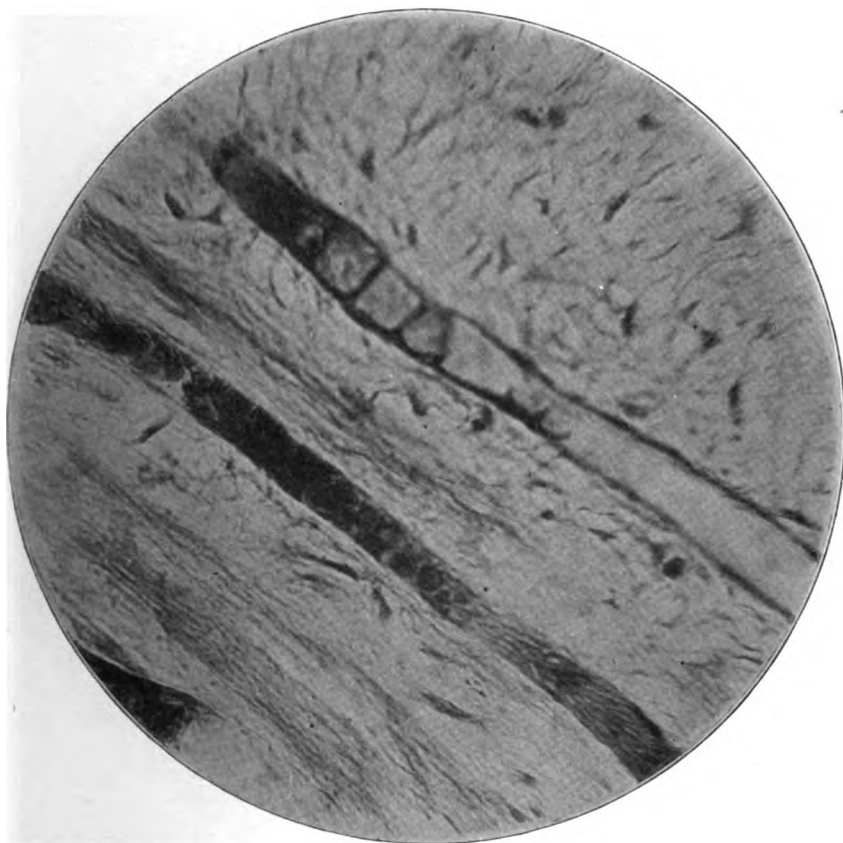
CAUSES.

Turning from the patho-histological aspect of this study, it is expedient and

useful to inquire what possible factors have contributed to bring about this condition. Why has the blood coagulated? Why have the vessels become thrombosed and the soft tissues degenerated? Prob-

selves. The vessels quickly become thrombosed, for instance, after the application of arsenous acid to an exposed surface of the pulp, because the vessels are under hydrostatic conditions and in-

FIG. 13.



Thrombosis and hyaline degeneration of arteries. (Magnified 500 diameters.)

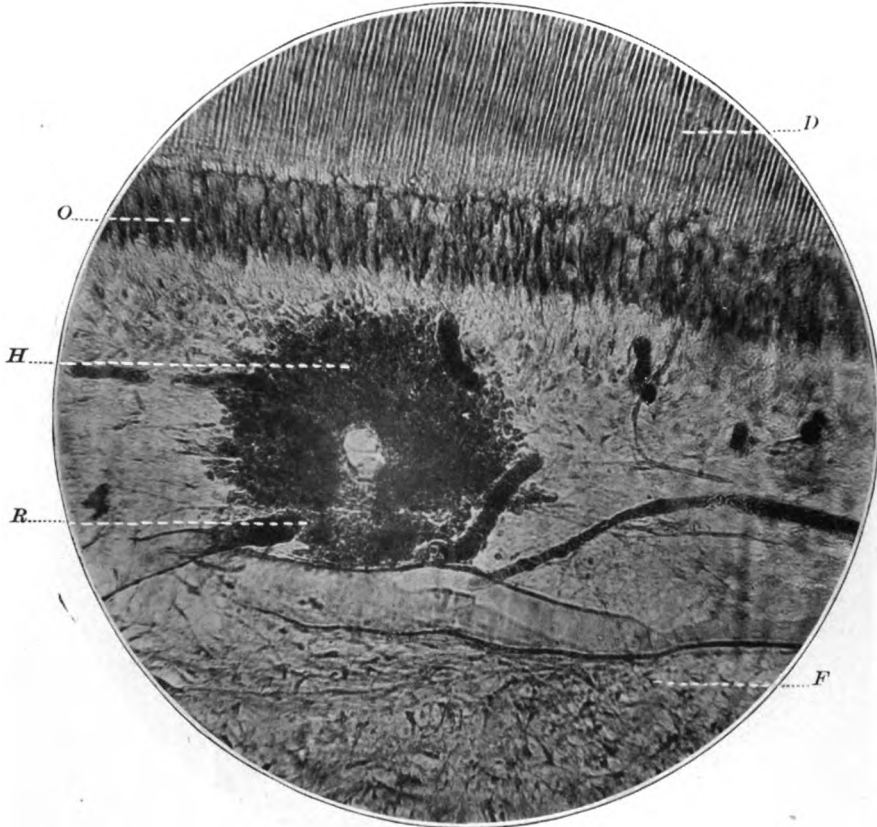
ably the absence of a collateral circulation predisposes to it; but its exciting causes cannot be so readily determined. This absence of collateral circulation would predispose to the onset of thrombosis in cases, also, where any obstruction of outflow existed, *e.g.* in cases of inflammation around the soft parts, or inflammation in the soft tissues them-

closed in a resisting wall of dentin. Any increased volume of fluid (blood) must be compensated by a corresponding outpouring—as there cannot be an adequate displacement of the surrounding parts, owing to their circumscribed nature—to afford the room required. (It must not be forgotten, also, that no lymphatics have ever been identified as

such in the pulp.) The thrombosis in this instance, which might almost be regarded as chemical or traumatic, is an early stage of acute inflammation, and is

zozero¹¹ in 1882, and Eberth and Schimmelbusch¹² in 1888, are the first of all the blood elements to accumulate on the vessel walls during coagulation, and

FIG. 14.



Details of Fig. 8. (Magnified 250 diameters.) H, Hemorrhagic infarct. R, Rupture of bloodvessel. D, Dentin. O, Vacuolated odontoblasts. F, Early fibrosis of pulp.

almost immediately followed by gangrene or death of the pulp *en masse*.

A thrombus may be the cause or the result of arteritis or phlebitis. It may be due to chemical changes in the blood itself or lesions in the walls of the vessels, as in degenerations. Osler¹⁰ has observed that in thrombus formation the blood platelets, fully investigated by Biz-

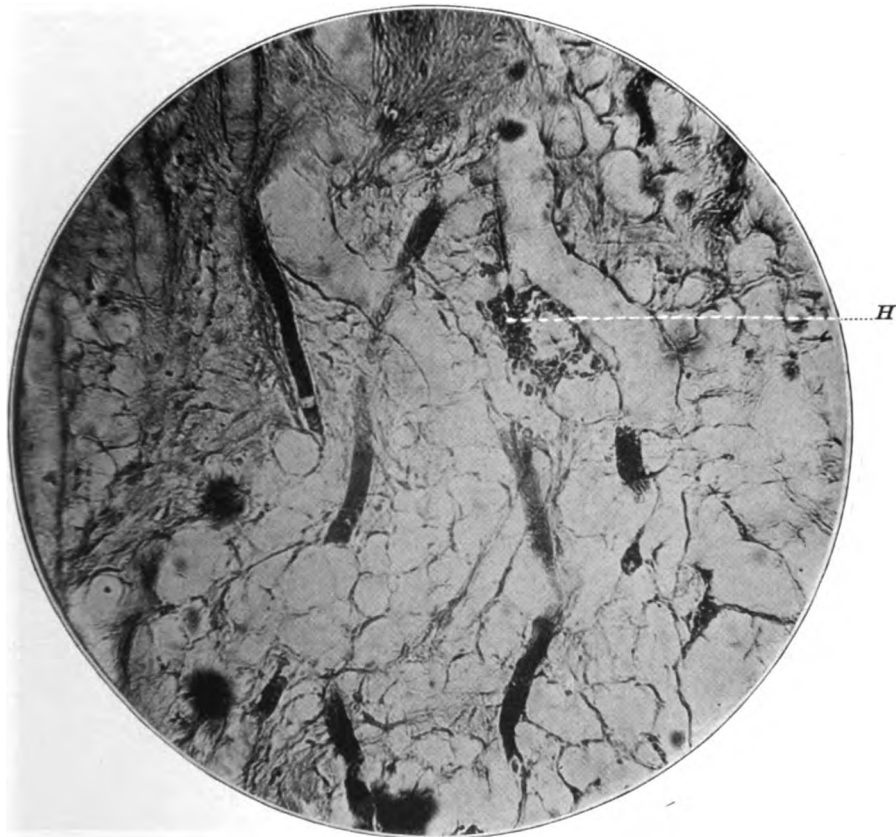
that the filaments of fibrin spread principally from these plate masses. They undergo viscous metamorphosis and also conglutination as explained by Thoma¹³.

The thrombi formed in the sections which form the subject of this paper are obviously neither entirely the "red" nor the "white" varieties, but are clearly for the most part of a hyaline character,

consisting of cells, platelets, fibrin filaments, and a colorless, semi-transparent, homogeneous material. They are entirely non-infected, although hyaline thrombi are generally associated with infected conditions.

atrophy, through loss of atrophic influences. The chemical changes are those undergone by the blood through systemic derangements such as anemia, chlorosis, and those which take place toward the end of exhaustive diseases.

FIG. 15.



Reticular atrophy of pulp with thrombosed capillaries. (Magnified 300 diameters.) H, Small hemorrhage near thin-walled vessel.

Thus it would seem that, in the dental pulp, chemical changes in the blood, plus the unusual arrangement of the terminal vessels, assisted by the *vis a tergo* which naturally leads to a certain amount of retardation of the flow and therefore coagulation—as first pointed out by Virchow—are the originators of the

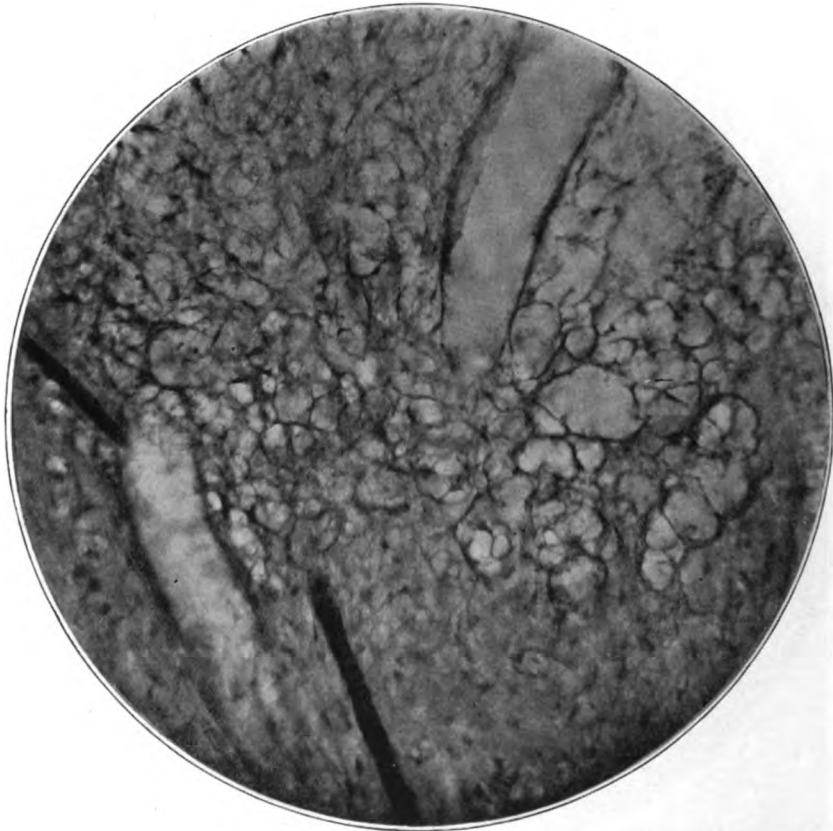
The suggestion of infectivity can be at once dismissed, as all the sections which have come under the writer's notice have been obtained from teeth, of the young and old alike, whose macroscopical aspects appeared to be sound.

It is of course well known that the blood of chlorotic patients may especially

tend to produce diseases of the vessel walls—due, no doubt, to the great diminution of red corpuscles and the relatively greater number of leucocytes, and their slow movement along the walls of

accompanied by the formation of adventitious dentin, or any amyloid or fatty degeneration of the pulp; and in no specimen yet examined by the author have there been evidences of chronic

FIG. 16.



Nearly normal pulp passing into a reticular condition. (Magnified 300 diameters.)

the vessels, together with an increased number of platelets. Marantic, anemic, and debilitated conditions which often form the sequelæ of long-continued and enfeebling fevers and diseases, probably also have the same or similar effects on the tissues of the vascular system.

The cases here presented are entirely free from intrinsic calcification, are un-

arteritis, atheroma or endarteritis, aneurysmal varix, phlebitis, or varicosity of the veins.

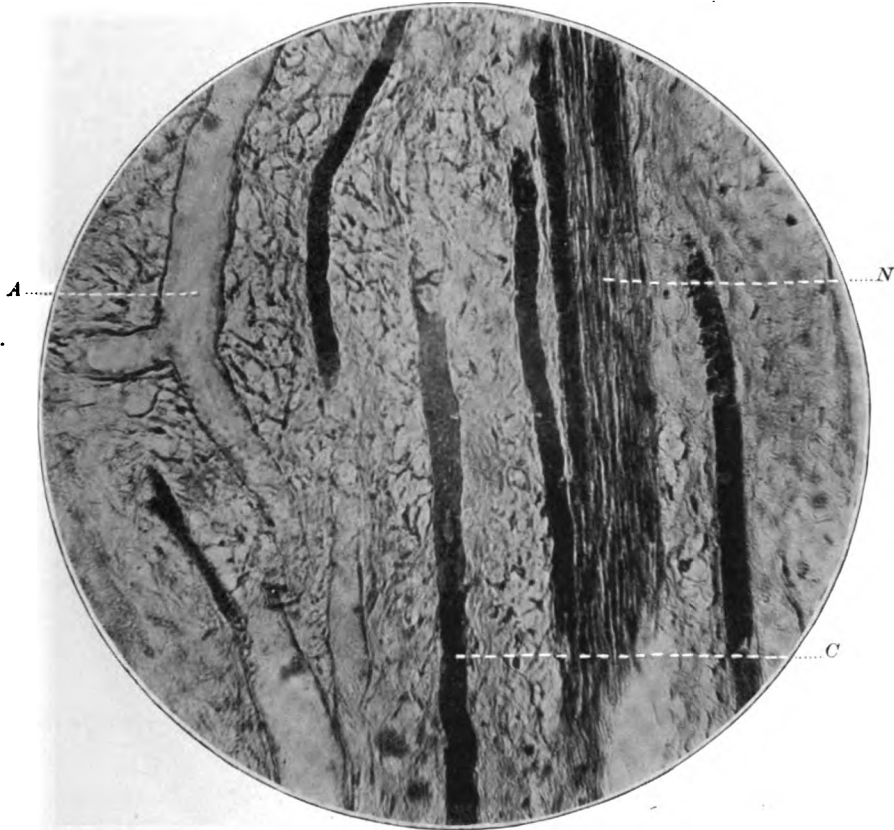
CLINICAL SIGNIFICANCE.

Of what value to the dental surgeon is a knowledge of the pathological states imperfectly sketched in the preceding

pages? Can it assist him in the more perfect performance of his daily duties? Certainly; for it is at once obvious that if an attempt be made to "cap" an exposure of a pulp which happened to be

manifest and indisputable. It is of course acknowledged that thrombosis and fibrosis are undiagnosable during life, but they may always be suspected in weak or unhealthy patients.

FIG. 17.



Details of thrombosis. (Magnified 250 diameters.) C, Thrombosed capillary. A, Artery. N, Nerve bundle.

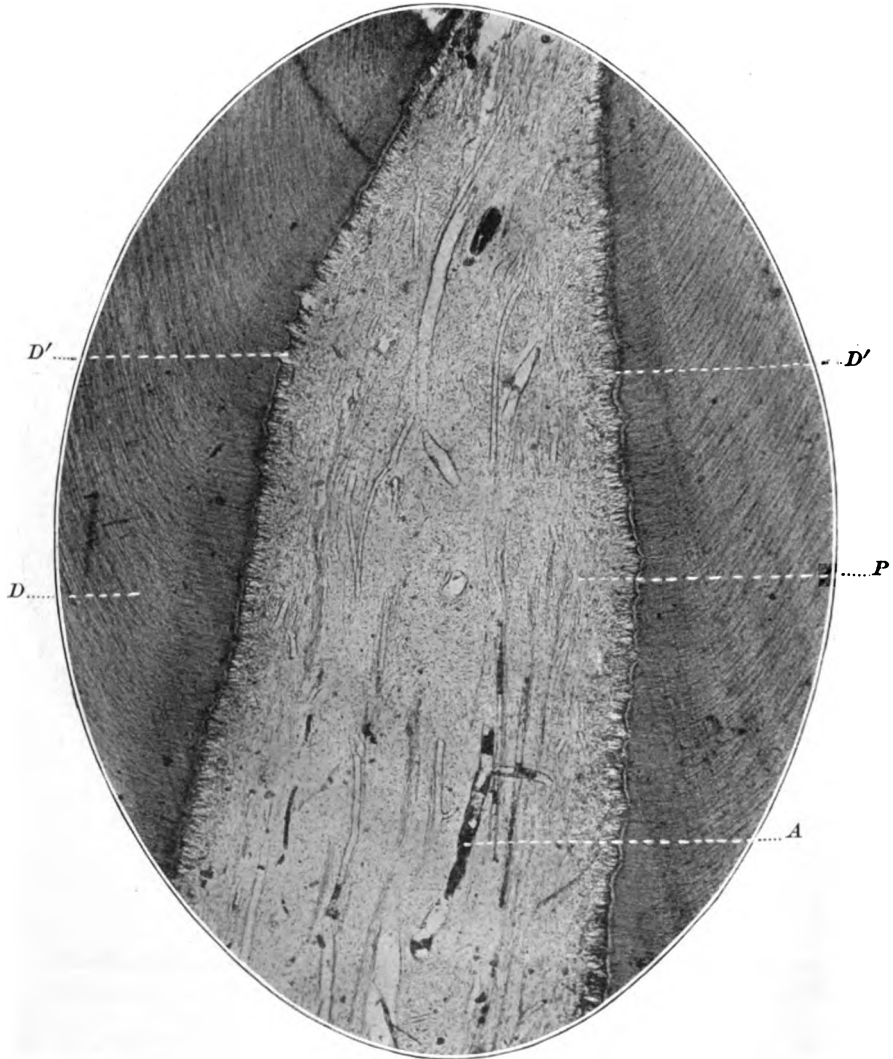
diseased in this way, no matter how carefully or how aseptically the operation be done, no new secondary or adventitious dentin would be produced to heal the breach of surface; and also the obstacles surrounding the complete devitalization of the pulp by means of arsenous acid, or its painless extirpation by means of pressure anesthesia, become immediately

The knowledge might perhaps explain the deaths of pulps where no evident lesion could be ascertained.

And, finally, it is not difficult to believe that, when the blood system of the pulp is deranged in the way already described, it is deprived of its trophic functions with regard to the tissues around. Teeth lose their accustomed vitality and become

more susceptible to outside influences and disturbances. At first remaining in jectively, the degenerated pulp may begin to pass on its lowered vitality to the den-

FIG. 18.



General view of pulp *in situ*, showing an intermediate phase of fibroid degeneration; longitudinal median section of canine. Prepared, stained, and magnified as in Fig. 1. A, Thrombosed artery. D, Dentin. D', D', Internal wall of dentin, showing clefts probably due to molecular changes. P, Pulp tissue beginning to degenerate.

situ, though affected by fibrosis, which exists unknown both subjectively and ob- tin and the peridental membrane. The former most probably is deprived of its

protoplasmic nourishment, wholly or in part, and undergoes more or less chemical or molecular change, and at times morphological change too, as seen in the photomicrograph Fig. 18, *D' D'*, becoming unduly brittle. The latter may easily and doubtless does share in the fibroid degeneration, which would assuredly sooner or later tend to loosening of the teeth in their alveolar sockets. It may, in addition, be hinted that perhaps this condition of lowered vitality may predispose the teeth to the onset of dental caries.

Enough has, however, been said to draw attention to the condition, and it is hoped that other workers in dental pathology may be hereby induced to correct, amplify, and complete the study of this fascinating subject.

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GROUND PORCELAIN CORNERS WITH MECHANICAL ANCHORAGE.

By P. B. McCULLOUGH, D.D.S., Philadelphia, Pa.

(Clinic at the forty-eighth annual meeting of the Pennsylvania State Dental Society, Philadelphia, June 26, 1906.)

THE prepared shape of the cavity is that indicated by the lines of decay or fracture. It may form two plane surfaces with one angle (Fig. 1), or one of two other forms, each with a plane surface. For a corner with one angle, the vertical plane forms an obtuse angle with the base, thus making two flat surfaces to be fitted. The vertical plane, A, may be formed rapidly with abrasive paper disks, and the surface made flat by means of the side of a vulcarbo disk and a Murphy file. The cervical plane, B, is finished with the edge of an abrasive disk and a narrow file. Any make of detached pin crown best suited in mold

and shade is selected and ground to fit the space.

The section to be used is outlined with a corundum disk and broken off. The vertical plane surface is first ground to size, then the cervical end is ground to proper length, when both surfaces are trued on the side of a fine stone on the lathe. (Fig. 2.) Throughout, care must be observed not to chip the edge.

A cavity is cut in the tooth so as to be shallow at the cervical angle with a flat base and pointing to the incisal edge (Fig. 1), where it becomes deepest, forming the only undercut, so that the matrix is drawn by turning out from the cervi-

cal end or angle. In this cavity is adapted 2/1000 platinum. Should the puncture be a considerable one, a second smaller matrix may be shaped over the puncture and adapted with wet spunk, which is left in place until invested. The matrix is filled flush with any filling

FIG. 1.

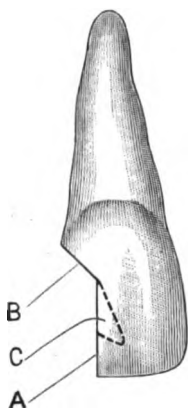
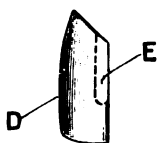


FIG. 2.



gold packed lightly, and 22-k. solder flowed through. This inlay, returned to the cavity, is ground flush with the edge of the latter, taking care not to injure the enamel.

The porcelain section is grooved vertically with a diamond disk, as a starter

FIG. 3.



FIG. 4.



only; then a piece of clasp-gold wire, F, of about No. 18 gage, is held in a screw chuck sold for the engine (Fig. 3), and with this wire used like a drill, the groove is cut into from the cervical plane surface, using carborundum powder in glycerin as the abrasive. This hole (Fig. 2, E), is so formed that while it is open on

the vertical plane surface where the wire is exposed it can only be withdrawn from the end by which it enters. This wire is cut off flush with the base of the inlay, and if necessary its exposed side is ground flush with the flat porcelain surface.

With the wire point in the porcelain, and the gold inlay in the tooth, the porcelain is rubbed to and fro on the tooth with wet pumice to finish the joint. Having the mouth napkined, the sections washed and dried, the inlay for the tooth in place, then the wire point, in the porcelain and warmed, is touched with the faintest particle of hard wax, a blast of hot air directed on the gold inlay, and the porcelain pressed to place. With the withdrawal of pressure the porcelain drops off, leaving adherent the gold sections, which are then removed, invested, and a particle of low-karat solder placed at a convenient spot to unite the sections. (Fig. 4.) With one mix of cement the gold is first placed, then the corner slid to place and held.

If, when the decay is such that after the vertical plane at the labial surface has been finished there still remains the unprepared edge of the cavity more extensive on the palatal surface, then this part is prepared independent of the labial plane, the matrix adapted over the edge and filled with the melted gold, so that when returned to the cavity the exposed surface is cut flat and flush with the labial enamel edge. By this means the joint with the porcelain on the palatal surface is made with the gold, thus obtaining a plane surface without cutting away labial enamel which it may be desirable to retain.

When the case presented admits of being ground to a plane surface the operation is made much easier. With the finished plane surface extending from a point at the incisal edge to the gum margin (Fig. 5), a cavity is cut of uniform depth and with a flat seat, G, and, as above recommended, a gold inlay is made. After the porcelain has been ground to fit, a small round clasp-gold disk is made of about No. 22 gage, which is held on a screw-disk mandrel (Fig. 6), and the

gold used with carborundum powder to cut a semicircular groove in the porcelain. (Fig. 7, H.) When this groove is cut as deep as the mandrel will allow the disk to

FIG. 5.

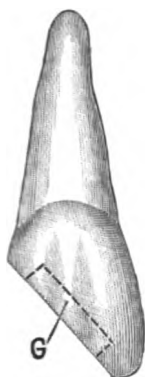
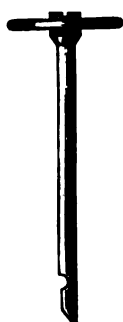


FIG. 6.



go, the disk is cut in halves, one piece filed flush with the ground surface of the porcelain, and, as in the first case, waxed to the inlay in the tooth, removed, invested, and soldered. (Fig. 8.)

It will be seen that in this class of cases a very delicate tapered point of porcelain remains at the joint with the tooth at the incisal edge, supported only

FIG. 7.



FIG. 8.



by cement—which is no support; therefore, since it cannot be expected that this point will last without protection, the following is offered as being used always with this as well as with the class first described, but was not given before in order to avoid repetition:

After the gold section has been placed with cement and the porcelain is in position ready to press to place, a piece of No. 60 gold foil or a gold roll is inserted in the joint to about one-sixteenth of an inch, then the porcelain is pressed home

and held until the cement has set. There being free escape for the cement throughout the joint, and it being least confined at the incisal edge, it will be seen that under pressure the cement is practically eliminated at this point, leaving the gold as a permanent support. (Fig. 9, I.)

That this gold cannot be seen may be believed when the thickness of No. 60 foil, as seen looking at its edge, is considered.

When the restoration is one where the entire incisal edge is gone, no change in the technique is indicated. The cavity in the tooth is prepared for the inlay (Fig. 10, J), and the porcelain cut with

FIG. 9.

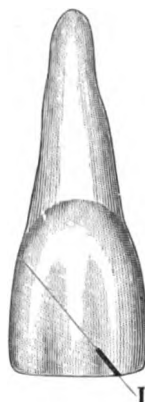
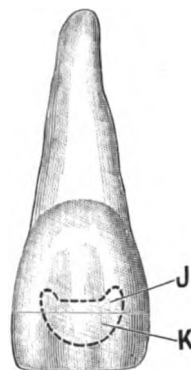


FIG. 10.



the gold disk, one half of which, K, is soldered to the inlay, J. Of course, in this class of cases the gold protection for the porcelain is not required.

The head of the mandrel, as well as the head of the screw carrying the circular gold disk to grind the cavity in the porcelain, is cut down, so that without the heads the disk may penetrate deeper in the porcelain.

Each of these cases presupposes vital teeth; in the first two, if devitalized, instead of avoiding the pulp by cutting toward the incisal edge, anchorage would be obtained by inserting a cone-shaped tube in the canal, filling it with melted gold and proceeding as above recommended.

The increased strength obtained by

this method, using the first case described as a basis of measurement for comparison with the methods usually practiced, is shown by consideration of the following features: The inlay fitting the cavity in the tooth is so shaped that it can be dislodged only by turning it out and down from the cervical end. When the

wire fitting the porcelain is soldered to the inlay, the former can be detached only by drawing down; thus every possible direction of the application of force is resisted mechanically by the gold bridging the joint, the cement serving to keep the corner from falling in the direction in which no force is applied.

A NEW AND EASY METHOD OF MAKING PERFECT GOLD FILLINGS.

By **W. THOMPSON MADIN, L.D.S. Eng. & Glas.,**

LECTURER ON OPERATIVE DENTAL SURGERY AT THE BIRMINGHAM UNIVERSITY; HONORARY ASSISTANT
DENTAL SURGEON TO THE BIRMINGHAM DENTAL HOSPITAL.

THE following is a method demonstrated at the last annual meeting of the British Dental Association in London, and set forth by me in a paper in the *British Dental Journal* of November 15, 1905. As the advantages of it have been further confirmed by experience, and as the growing tendency of the best operators is toward combination fillings, I am emboldened to describe it more fully. Dr. Head and others have often given evidence of the advantages of cement with metal fillings, and recently Dr. J. F. P. Hodson has described a method of procedure of his which is very much the same as mine.*

For many years I have distrusted fillings the material of which did not stick to the walls of the cavity, and for a long time have rarely made an amalgam filling which was not pressed into wet cement. In the case of gold fillings, I think that observant men will generally agree with me when I say that only here and there is found a genius who can consistently fill cavities with gold so that the gold is perfectly adapted to the walls of the cavity, and the filling water-tight.

I am constantly seeing fillings made by myself and others which by the tell-tale blue discoloration or the white opaque ring around them show that caries is still progressing, and that the filling is useless.

We know that this condition practically never occurs with inlays; but inlays, beautiful as they are, and undoubtedly useful as all who have had experience of them must agree that they are, have two weak points—they are only held in by the adherence of the cement, and they do not protect weak walls, because the material is not of itself strong enough to bring over beveled edges. Gold, still the king of all fillings, can by this method be keyed into the cavity by undercuts, whilst there is a lining of cement which perfectly obviates the old risk of non-adaptation, and tends to do away with the showing through of the gold in the case of thin enamel on labial surfaces; and the gold, being tough, may be brought over weak edges, protecting them as does no other material that I know. It very largely reduces the time necessary, too, as it does away entirely with starting-points and retaining-pits; although, of course, in using cohesive gold all through, as is done in this case, one can never hurry unduly. I use this method now

*See report of the New York Odontological Society meeting of April 17, 1906. *DENTAL COSMOS*, 1906, vol. xlviii, p. 1121.

in every case; it is applicable to tiny cavities as to the largest contour fillings, and makes gold filling as easy and sure as using amalgam. In filling cervico-labial cavities—previously a difficult class of cavity to deal with on account of the trouble in obtaining dryness—all difficulty disappears, as the rubber dam and the cervical clamp are quite unnecessary; though in all other cavities the rubber being so easily applied is a great advantage. The cavity is thoroughly opened up, and in this I may say we have learned a great deal from the inlay workers—their necessity for open flaring edges showing the ease with which patches of softened carious dentin might be left in hidden corners. It is then given a retentive form by undercuts or dovetails, and the simpler and shallower and less angular these are the better. The cavity edges it is my habit to leave quite square by means of a disk, so that the filling may be brought over and the full thickness to the outside inclosed in gold for protection; the exact opposite to the sharpened-from-inside edge of an inlay cavity.

The rubber having been applied, either before preparation or after, as best suits the operator's taste, and the cavity dried, a piece of No. 30 gold foil is cut exactly as for taking an impression for an inlay; thin cement is now mixed (again as for fixing an inlay), and with it the inside of the cavity is smeared well over, and the No. 30 gold foil is pressed home into it with amadou, in the usual impression method. Special pressure is given in the direction of the undercuts, and often a ball burnisher is pressed in that direction also. This gives an undercut cavity, beautifully lined with gold, with cement in every possible irregularity. It is important to see that the edges of the cavity show up quite sharply, as only by that can one tell that when the filling is finished there will be no cement at the

margins. This is easily done, however, with pressure on amadou, followed by a burnisher around the edges; thus, though I examined all my early fillings with a magnifying glass, I never found a trace of cement around a finished filling. It will now often be found that the foil has been split, and a little cement is oozing through; this is not at all a disadvantage, as a piece of gold patted gently over the split stays in position at once. Into the gold-lined cavity, without waiting for the cement to set, I loosely place several pieces of sponge gold, beginning with the undercuts, and press them home, again with amadou; then condense thoroughly with hand pluggers, and finish the filling in the usual way. Any cohesive gold which the operator is in the habit of employing may be used; I personally use sponge gold, topping up with two or three layers of No. 30 as used for the impression, but that is a matter for purely individual taste. In the special case of the cervico-labial cavity mentioned above, the cavity is prepared, dried, and kept dry with napkin or wool roll, and the impression gold overlapping the gum effectually prevents any oozing. I have recently had an extensive case of so-called erosion on the surfaces of the upper and lower teeth, and the latter, which previously I should have regarded as very difficult, were, with the help of a saliva ejector, filled as easily as they could have been had amalgam been the filling material.

This mode of working has entirely altered my methods of practice. Previously, subscribing to the old adage that "In proportion as a tooth needs filling, gold is the worst material for the purpose," I did not dare use gold in very weak teeth; now I know that the protection obtainable at the edges, and the adherence of the cement, make gold the ideal filling for teeth with frail walls.

THREE ORTHODONTIA CASES.

By S. MERRILL WEEKS, D.D.S., Philadelphia, Pa.

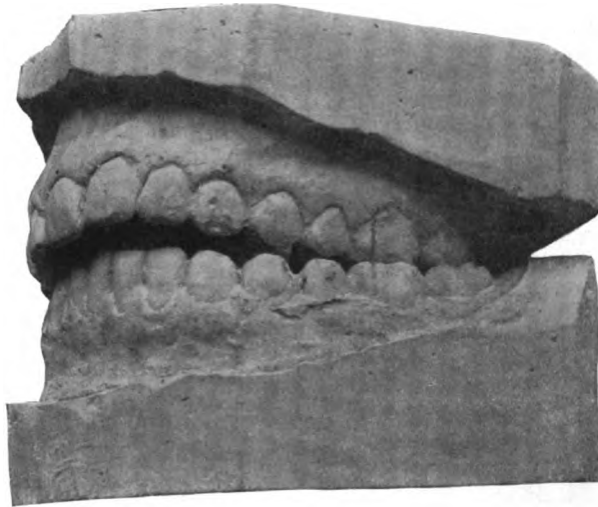
(Clinic at the thirty-eighth annual meeting of the Pennsylvania State Dental Society, Philadelphia, June 28, 1906.)

CASE I. Fig. 1 represents the casts of the mouth of a young lady seventeen years of age. The conditions are of such an unusual nature as to lead me to believe that a description of the case would be of interest to the profession. It came under my observation in October 1905.

to end in the molar region. This condition seemed to become progressively although slowly worse, eventually affecting the facial balance.

On preparing casts of the two arches and carefully noting the condition, I found that a degree of contraction of the upper arch—amounting to about half the

FIG. 1.



Briefly, the history is as follows: Until within two years the teeth were in a beautifully normal occlusion; at least such was the firm conviction of not only the patient and her family, but likewise of her dentist. About that time it was noticed that the teeth of the upper left side failed to meet the lower teeth, and the difficulty seemed to be wholly with the upper arch, it being most pronounced at the median line, diminishing gradually,

width of the teeth bucco-palatally—had taken place from the canine backward, and only on the left side. This feature of the case I believe will become significant when considering the etiology of the deformity. The left side was also in mesial occlusion, viz, the lower teeth were occluding distally to normal in their relation to the upper teeth. This would place the case in Class II, division 1 or 2—depending on whether it was caused

by abnormal breathing—and in the subdivision, because it existed only on one

able wrinkle, extending from the ala of the nose to a point beyond the angle of

FIG. 2.



FIG. 4.



FIG. 3.



FIG. 5.



FIG. 6.



side. I found also that the muscles of the lips and cheek were being drawn backward and upward, causing a notice-

the mouth, as shown in Figs. 2 and 3, which are reproductions of trimmed photographs. A careful study of pho-

tographs taken several years previously seemed to show no such condition, and it was the opinion of the parents that it was fast assuming more marked proportions.

of mouth-breathing, and the features did not seem to indicate the possibility of such a cause.

The failure of the teeth of the upper left side to occlude properly appeared to

FIG. 7.

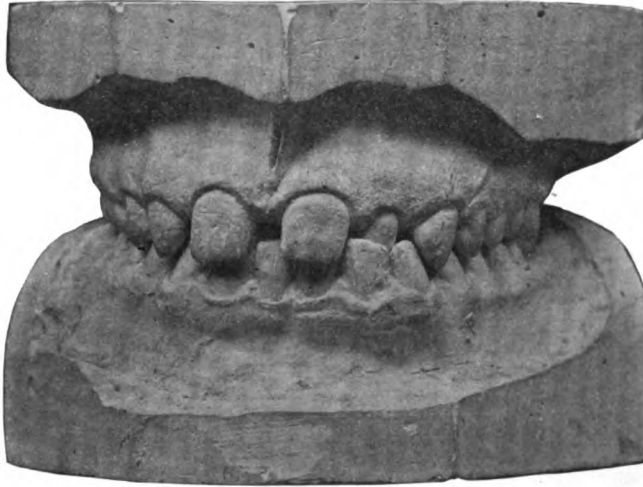
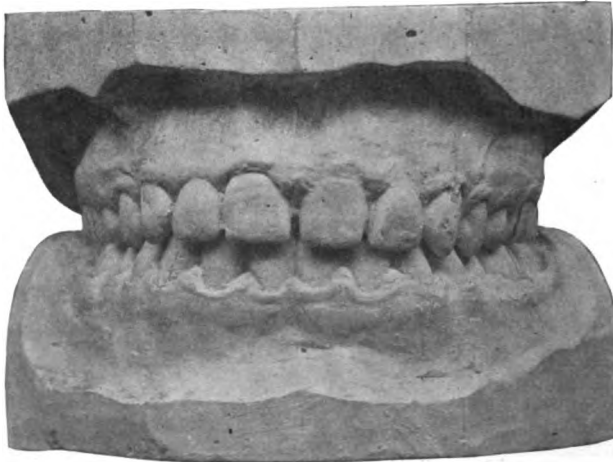


FIG. 8.



Some of the factors leading to this condition are obscure, and I shall pass them by without attempting to explain particularly the cause of the contraction of the upper arch, as I could obtain no history

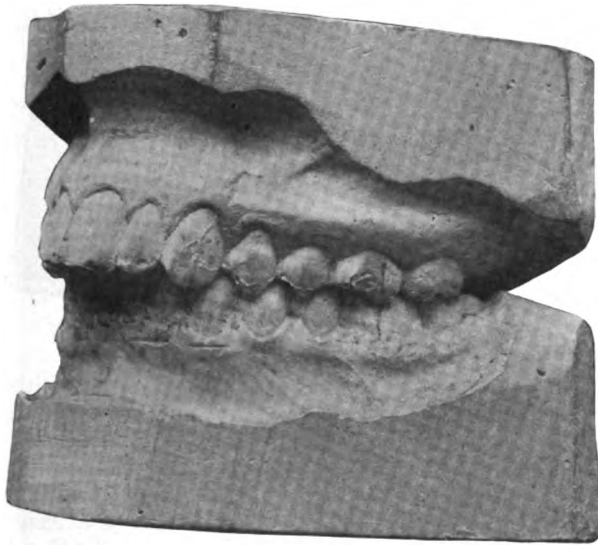
indicate by the existing relations that the cause was wholly in the upper arch, and the fact of the condition being more marked at the median line and diminishing gradually would likewise seem to

point to the maxilla as the initial etiological factor. The author is of the opinion that some change had taken place in the sutures, and, to substantiate this, a radiograph shows distinctly an incomplete union between the halves of the maxilla at the median suture. The cause would seem to be indicated by the conditions existing in the mouth. It is to be noticed that the intercusping of the

bodily, and its progressing evenly would seem to indicate that a movement of the alveolar process, if not of the maxillary bone, has occurred. The degree of success of the treatment is indicated by the second photographs (Figs. 4 and 5), and by the photo-engraving of the cast taken at the completion of the work. (Fig. 6.)

Case II. This was the case of a boy

FIG. 9.



teeth on the right side is normal, while on the left side the teeth had been, and were now in the posterior part of the mouth, occluding with the cusps end-to-end. Such a condition would bring a greater degree of pressure on the left side during mastication, and would be sufficient, the writer believes, to account for all the subsequent changes.

The treatment consisted in expanding the arch so that it would properly occlude outside of the lower arch. It was necessary to accomplish this not only to allow for the proper relation of the upper and lower teeth, but also to retain the proper relation of the planes of occlusion between the lateral halves of the arch. The elongation of the teeth of the upper left lateral half of the arch was carried out

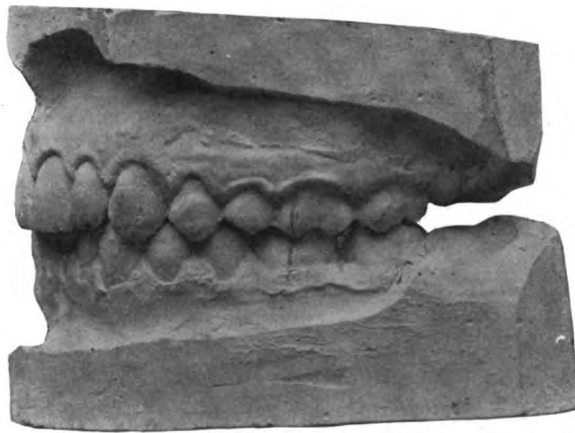
fourteen years of age. It is a case of Class I, in which the irregularity was caused by the entire absence of the upper right lateral incisor and by the abnormal shape and size of the upper left lateral incisor. The posterior teeth were practically in normal position. (Fig. 7.) The requirements of the case were (a) to move the upper left lateral to labial occlusion and to provide it with a crown presenting a natural appearance, and (b) to move the right central incisor to the left, in order to provide sufficient space for an artificial upper right lateral.

The difficulties that were encountered were found in moving the right central without tipping it, and in securing sufficient anchorage without interfering with the existing normal relation of the mo-

lars and bicuspid. The latter was obtained by a careful adjustment of the appliances, so as to utilize the posterior teeth of both sides of the upper arch. To Dr. W. W. McKay should be given

sary to improve the facial lines by securing a normal prominence of the mandible. (Fig. 9.) It was brought about by a lateral expansion of both arches, and by moving forward the lower arch to

FIG. 10.



the credit for so satisfactorily supplying the missing structures. The left lateral incisor was supplied with a jacket crown, and the right lateral incisor was substituted with a removable piece attached to the canine, and provided with a spur resting upon the right central incisor. (Fig. 8.)

Case III. In this case it was neces-

its normal relation with the upper. The case responded to the treatment so easily as to indicate that the temporo-maxillary articulation had been in an abnormal relation at the beginning of the treatment. The patient was fifteen years of age, and the result as affecting the regularity of features was highly satisfactory. (Fig. 10.)

A UNIQUE METHOD OF SUPPLYING A MISSING ANTERIOR TOOTH.

By EDWIN E. DAVIS, D.D.S., Boston, Mass.

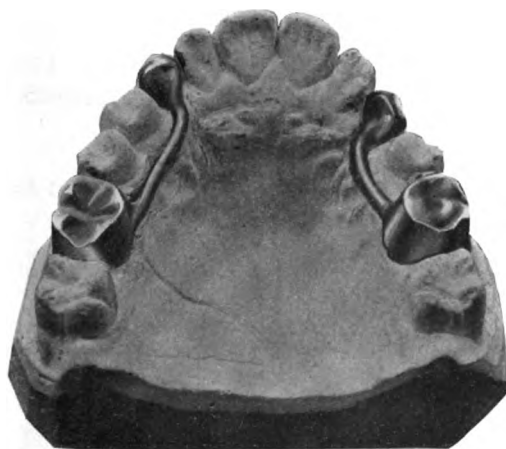
(Clinic at the forty-second annual meeting of the Massachusetts Dental Society, held at Boston, June 6, 1906.)

THIS is a very simple, useful, and so far as my experience goes, exceedingly satisfactory method of substituting a natural tooth by a porcelain facing, and in such a manner as to leave no visible trace of the operation.

The second bicuspid or first molar on the same side on which the loss has occurred is prepared for a gold crown. The

of determining the best tooth to be crowned. A gold crown of fairly heavy thickness is perfectly fitted and adjusted to a perfect occlusion with the opposing teeth.

Just a word here in regard to the reinforcement of the grinding surface of the crown. Cut a piece of gold or platinum of No. 22 gage that will just drop



selection of the tooth to be crowned is determined by the peculiar characteristics of each individual mouth. If, for instance, the teeth are not much exposed to view when the patient talks or laughs, the second bicuspid may be used, but if the teeth are exposed considerably it is better to crown the first molar. Sometimes, and in fact frequently, one or the other of these teeth is quite largely filled or is broken down; or conditions of occlusion may be such as to govern the matter

into the crown and cover the grinding surface. Swage or burnish it to fit the contour of the occluding surface, and solder it to the gold surface. This will afford an even and safe protection against wear.

With the crown in position on the tooth, an impression is taken with modeling compound, the crown removed and replaced in the impression, and a plaster cast run. We shall now have a model of the mouth with the gold crown in posi-

tion. A facing of proper shade, shape, and size is selected and backed with gold, allowing the backing to reach only to the cutting edge and not to cover it. It is then ground to fit the cast and waxed into position from the inside. Thin plaster is run over the outside of the facing and cast, to hold the facing firmly in place. The wax is removed, and a shallow furrow carved on the roof of the cast from the anterior side of the gold crown to the facing, following the gum margin at about one-eighth of an inch from the teeth. This is to allow the connecting bar to set firmly and snugly against the roof of the mouth.

Now a piece of platinum wire of No. 13 gage is flattened slightly on the anvil, or it may be rolled, and the flat side is rounded with a fine file. This is bent and twisted so as to conform exactly to the

carved groove in the cast, and to merely touch both the crown and the facing. Held in position with a bent pin inserted into the cast, it is soldered at each end, and the case is removed, finished, and set in the mouth, care being taken to hold it in position until the cement is quite hard, as it is desirable that the bar should set firmly against the gum.

The pressure of the bar is unnoticed after a short time, and little or no interference in talking is experienced.

The accompanying illustration is a reproduction of a cast from the mouth of a young lady who had lost a retained deciduous upper canine, with no indication of the permanent canine erupting. Some three years have elapsed since the operation was carried out, and the case is in perfect condition today.

REMOVABLE BRIDGES WITH GOLD INLAY ABUTMENTS AND SADDLE AND VULCANITE ATTACHMENT.

By J. A. PENNINGTON, D.D.S., Pittsburg, Pa.

(Clinic at the meeting of the Pennsylvania State Dental Society, held at Philadelphia, June 28, 1906.)

IN the construction of this work we begin with the swaging of the saddle or plate. In swaging be careful not to allow the saddle to extend under any undercuts or to impinge on muscles, as, it being held perfectly rigid, the resistance is too great to allow free action of the muscles—a condition which would result in a certain degree of irritation. As all pins and tubes must be parallel and draw direct, a saddle extending beneath undercuts will drag, likewise causing irritation.

PREPARATION OF CAVITIES.

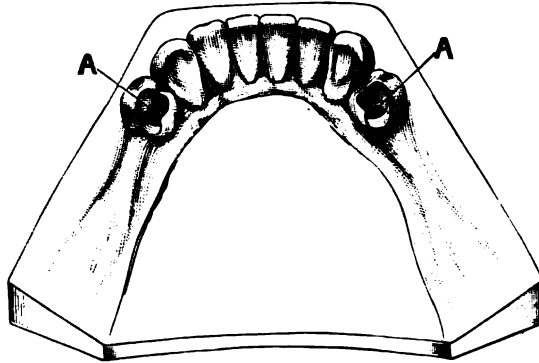
As shown in Fig. 1, A, A, prepare as broad and deep cavities as the teeth will

admit of without weakening them, with square seats and walls at as near a right angle to the seat as possible, slightly diverging toward the occlusal surface so that the matrix will draw, and slightly beveled on the occlusal edge so that the inlay will protect the enamel walls.

TAKING IMPRESSION OF THE CAVITY AND MAKING THE INLAY WITH TUBE ATTACHMENT.

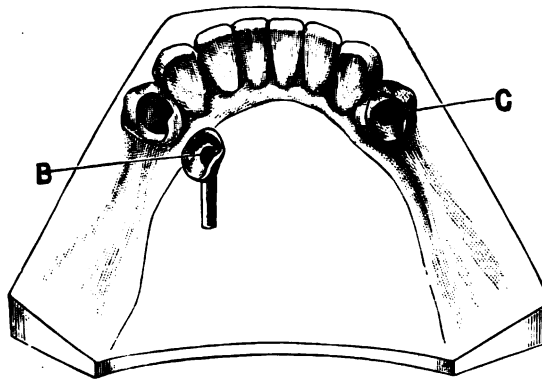
Use matrix platinum foil 1/1000 of an inch in thickness and prepare the matrix as for a porcelain inlay. After the matrix is well burnished and placed in the cavity, insert the tube through the matrix into the enlarged canal, being always

FIG. 1.



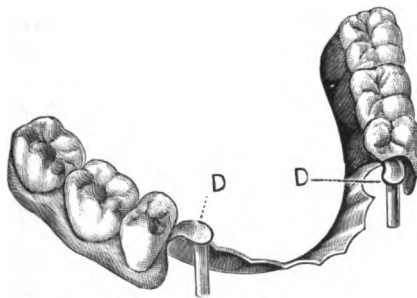
Prepared cavities in first bicuspid.

FIG. 2.



Cavities prepared in the inlays, with tubes.

FIG. 3.

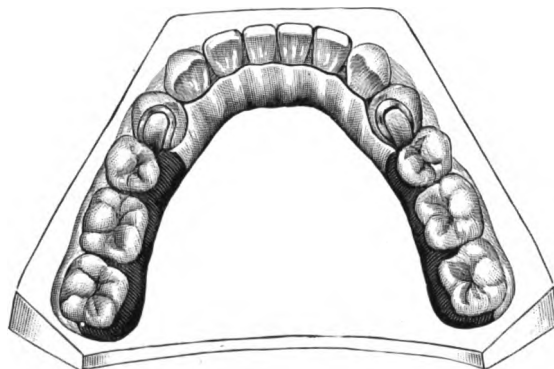


Inlays with split pins. The inlays, D, D, restore the natural contour of the abutment teeth.

careful to have all the tubes parallel. Wax the matrix and tube in place with hard wax, remove, invest, and solder

move the impression with all the parts in place. From the latter prepare a cast. In these inlays with tubes, prepare

FIG. 4.



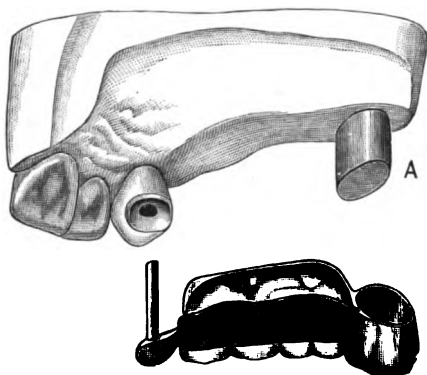
Completed piece on cast.

them together, using 20-k. or 22-k. solder, at the same time restoring the contour of the tooth.

After the inlays with tubes are made

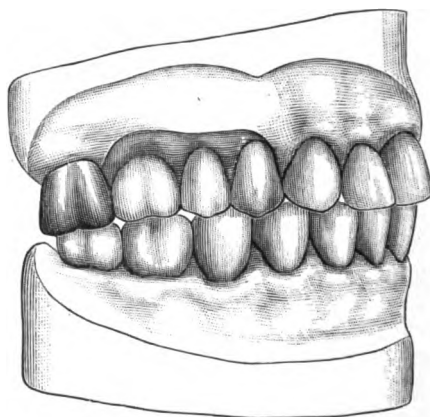
cavities as shown in Fig. 2, c. For these cavities second inlays are prepared, to which the split pin is attached. In preparing these cavities have as broad and

FIG. 5.



Bridge removed from cast showing cap on molar and gold inlay and tube on lingual surface of canine to receive split pin and inlay attachment.

FIG. 6.



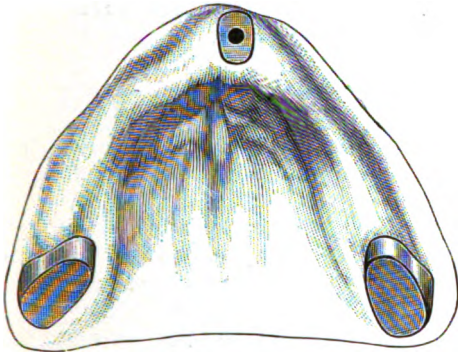
Completed bridge shown in Fig. 5, on cast.

and the saddle is swaged, place these parts in position in the mouth and secure an impression of them. Allow the plaster to be a little stiff so as to force the saddle well into the soft tissue. Re-

as deep a seat as the inlay will admit of, with buccal and lingual walls at as nearly a right angle to the seat as possible, and with sufficient slope to admit of drawing the split pins. To this cavity adapt a

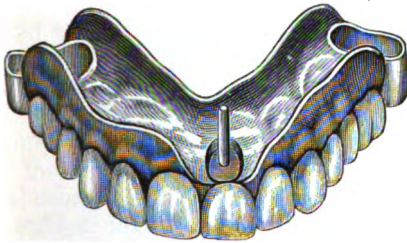
matrix of pure gold, gage No. 38 to 40, and through the latter insert a pin into the tube. Wax the several parts, remove them, and proceed in the same way as

FIG. 7.



Cast showing capped molars and cap and tube, on root of left central incisor.

FIG. 8.



Bridge with telescoping crowns and cap and split pin to fit root of left central incisor.

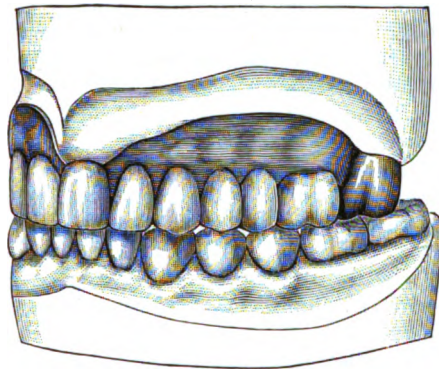
with the first inlay, being careful in soldering to restore the contour of the tooth as shown in Fig. 3, D, D. This completes the inlay abutments.

When the abutments are made, place them in position with the saddle on the cast; wax the inlays with pins attached to the saddle—using hard wax in all this work; remove them from the cast, invest

and solder them, at the same time soldering cleats to the saddle for the support of the rubber attachment. With the piece so far completed, take the bite, articulate it, and proceed as in the case of ordinary dentures. Fig. 4 shows the work completed on the cast.

The cases shown in Figs. 5 and 7 are constructed in the same way as that shown in Fig. 1, with the exception of the pin and tube and the telescope abutment

FIG. 9.



attachments, which are constructed according to the method devised by Dr. Fred A. Peeso.

Fig. 5 shows a bridge removed from the cast, also showing the cap on the molar for the telescope, A, and the gold inlay and tube in the lingual surface of the canine for the split pin and inlay attachment. Fig. 6 shows the completed work articulated.

Fig. 8 shows a bridge removed from the cast (Fig. 7) in which the molars have been capped to receive the telescoping crowns of the bridge. A cap and tube have been inserted in the root of the central incisor for the reception of the split pin and cap attachment. Fig. 9 shows the completed work articulated.

CORRESPONDENCE.

FORMALIN AND TRICRESOL IN COMBINATION IN THE TREATMENT OF PUTRESCENT PULPS.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—A most interesting and important essay on dental therapeutics, under the title of "The Rational Treatment of Putrescent Pulps and Their Sequelæ," appeared in the issue of the *Cosmos* for May 1906, by Dr. J. P. Buckley of Chicago.

This important subject should have more attention than has been given it of late years, and it may not be out of place if you will permit me to give a few statistics concerning the use of this valuable combination of drugs, viz, formalin and tricresol.

Some two years ago I began the use of this combination for putrescent canals, and its use was attended with such surprising results that I began a series of experiments with it. I do not remember where I first heard of the use of these medicines in combination, but as Dr. Buckley claims priority we will give him the credit, and it may be that it was his former article on the subject that I read.

While in practice in San Diego, Cal., I used this formula, and, like Dr. Buckley, found that if confined to the treatment of those cases where it is indicated it will give the results sought in *almost* every case—not in every case, as we have some failures with the best of remedies. However, I have attributed the failure to my faulty manipulation in cleansing and properly filling the canal after the remedy had been used. On the other hand, if this remedy be used in cases where the pulp is not putrescent or gangrenous, it will raise trouble that will

in all probability cause the dental surgeon to condemn it as unfit and dangerous.

Since entering the United States service and being appointed to duty in the Islands, I have had abundance of opportunity to test the merits of Dr. Buckley's formulæ—as in this country the soldier soon became emaciated, and is found seeking dental services. In a great many cases where the pulps would not have putrefied in the States they have done so over here, and the number of men to be treated makes it evident that we must find some remedy that can be inserted in a very short space of time and still be potent enough to do what is required of it. Formalin and tricresol have done the work, and I am of the opinion that fewer failures will result from the use of this combination of medicines than with any other known to the profession today. My experience with it has been a most happy one.

The solution of mercury bichlorid has never been used by me after the dressing with the former drugs and the good results obtained notwithstanding would tend to demonstrate the fact that it is not a necessity. I have been using a mild sedative as an after-treatment, and filling the canals as soon as odor was absent; the sooner the better, provided the inflammatory conditions have subsided.

Yours truly,

CROXTON L. RION,

Dental Surg. U. S. Army.

CAMP JOSSMAN, GUIMARAS, P. I.

July 7, 1906.

PROCEEDINGS OF SOCIETIES.

MASSACHUSETTS DENTAL SOCIETY.

Forty-second Annual Meeting.

(Continued from page 81.)

CLINICS.

Dr. C. H. GERRISH, Exeter, N. H.
 "Napkins and Cohesive Gold Foil."

This clinic consisted of the making of gold fillings of non-cohesive in combination with cohesive foil; also practical demonstrations of the use of napkins for keeping the mouth dry in minor operations lasting as long as a half-hour.

Dr. L. C. TAYLOR, Hartford, Conn.
 "Methods of Filling Small Cavities in Children's Front Teeth."

The object of the clinic was to show the importance of filling very small cavities in the teeth of children as young as eight or ten years of age. Dr. Taylor used for this purpose cement and gold in combination; just sufficient amount of gold in finishing the filling to protect the cement and prevent it from dissolving out of the cavity. This operation is performed with the aid of heated instruments.

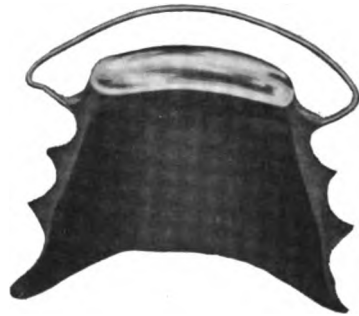
Dr. C. WESLEY HALE, Springfield.
 "Adapter for Abscess Syringe."

Dr. Hale gave a demonstration of a little appliance which he termed an "adapter," to be used in connection with the syringe, whereby the operator is enabled to carry medicine into cavities and root-canals and through the fistulæ of abscesses.

Dr. A. W. DOUBLEDAY, Boston. "Combination Inclined Plane and Retaining Appliance."

This appliance (Fig. 1) is constructed to take the place of those which have heretofore been composed of all metal, and have the plane soldered to the anterior portion of an appliance which is cemented to two or more teeth; for the reason that with such an appliance a great many of the shredded or fibrous

FIG. 1.



foods give no end of disturbance. In most cases where this appliance has been used, the arch has been expanded and the anterior aspect of the mouth greatly modified, often to the extent of rotating one or more teeth. A vulcanite plate forms the substantial part of the appliance and covers the roof of the mouth, including the first molar. A platinized gold plane (with suitable attachments soldered to the back) is vulcanized in the correct position so as to properly draw the mandible forward at each closing of the mouth; also a platinized gold or Ger-

man silver wire of from No. 16 to No. 21 gage (according to pressure desired) is vulcanized into the plate, extending out through the approximal spaces between the canine and the first bicuspid, and across the labial surface of the six anterior teeth.

be removed. The anterior wire serves to retain the arrangement of the anterior teeth, and pressure may be increased or relieved on any of these teeth by a slight shaping of the wire with contouring or other suitable pliers.

Figs. 2, 3, and 4 show an example of

FIG. 2.

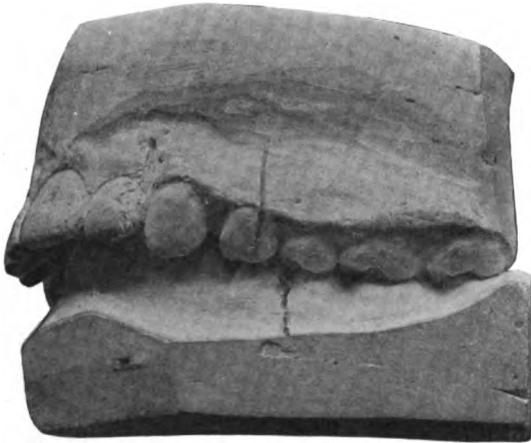


FIG. 3.

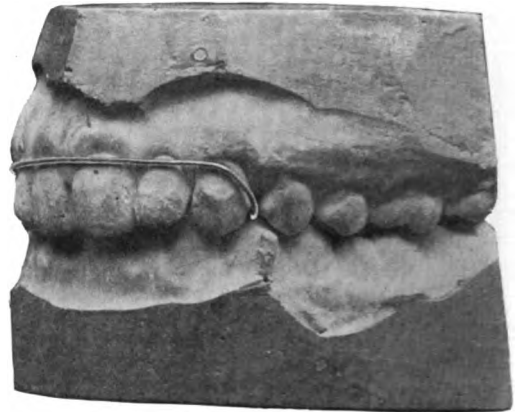
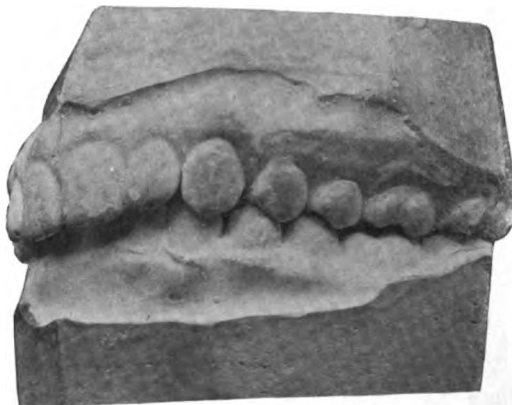


FIG. 4.



The plate serves as a retainer for the expanded arch. The inclined plane at the same time modifies the bite, which in most cases, especially in persons under twenty years of age, will have become fixed in from six to eight weeks, so that this portion of the appliance may

results obtainable with this appliance. It may be removed by the patient at will for cleansing the teeth. Hearty co-operation and appreciation on the part of the patient make it unnecessary to cement this appliance to the teeth in order to have it continuously worn.

Dr. H. CARLTON SMITH, Boston. "Appliances Used in Testing Amalgams, Cements, Etc."

The clinic given by Dr. Smith illustrated the course in dental chemistry given at the Harvard Dental School. This course aims to make practical application of chemical science to the problems of dentistry, and the clinic included the simpler methods of salivary and urinary analysis, which might serve to indicate more or less obscure systemic conditions bearing on dental diseases. The object of the clinic was not to show the very little that has been done up to the present time, but rather to stimulate interest in such investigations, in order that much more may be accomplished.

Methods of teaching were also shown, together with samples of laboratory work, this work including the preparation, tests, and analysis of amalgam alloys and cements, also the micro-chemical examination of local anesthetics, etc.

Dr. N. P. BUGBEE, Springfield. "A Method of Bridge Attachment."

This clinic consisted of the demonstration of a bridge extending from the first molar to the first bicuspid. A gold cap was placed over the molar, and, as the bicuspid had a large gold filling on the distal surface, a groove was made in the filling and a bar to rest in this slot, thus allowing for the movement of the teeth as in a normal articulation. Where teeth are banded by crowns on both abutments this movement is lost and the value of the teeth impaired.

Dr. E. W. MOORE, Newport, N. H. "A Card System for Dental Accounts."

Dr. N. A. STANLEY, New Bedford. "Porcelain Molar Crown."

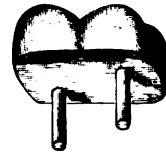
The present crown, while essentially the same, has been somewhat simplified, and is more easily constructed than the one described a year ago at this clinic. In place of three pins, he uses a staple (Fig. 1) of No. 18-gage pure platinum wire. These two pieces of platinum serve three purposes. The thin piece of plate

makes a perfect joint; and the loop holds the porcelain and prevents the ends from spreading through contraction in baking. The staple can readily be fitted to the holes in the tooth. Corresponding holes are made in the plate, and the staple is

FIG. 1.



FIG. 2.



soldered to the plate with pure gold. After the cap has been malleted, burnished and trimmed to fit the end of the root accurately, cover the loop with sufficient wax preparatory to securing the bite; the wax is cooled by means of cold or iced water before removing it from the mouth. A sufficiently accurate cast can then be obtained to finish the operation. Before setting the finished crown (Fig. 2), "butter" the platinum with Evans' gutta-percha cement in order to obtain as perfect a joint as possible. The application of a little eucalyptus oil and the use of a sharp-pointed instrument will enable one to trim away the surplus gutta-percha.

Dr. A. J. SAWYER, Manchester, N. H. "To Band a Root so that the Gold will Restore Accurately the Contour between the Root and the Crown."

Prepare the root by beveling considerably toward the crown end. Cut the band sufficiently small to allow of its being fitted to the smallest portion of the prepared end of the root, so that when pressed to place it will stretch and closely fit the beveled portion. Now grind the root, with the band in position, as short as desired. Then grind any all-porcelain crown, preferably a detached-post crown, in length and occlusion to fit the case. Burnish or swage a piece of No. 35 pure gold to fit accurately the end of the porcelain crown next to the band.

Place the crown with the gold on the now banded root, and with the tooth

in proper position mark the outline of the gold band on the gold burnished over the end of the crown, so that both the band and the gold on the crown can be removed intact, and caught together with a very minute piece of solder on the lingual side only (just enough to hold the two pieces together). This is then replaced on the root and the crown put in position. As the band and crown plate have only been slightly caught together on the lingual side, there is left some latitude in the adjustment of the band and crown plate, which are now made perfect as to their relation to each other, although they need not necessarily fit closely together. Both the band and crown plate are now slipped off; the inside of the band and the side of the crown plate where the crown is to sit are filled with powdered asbestos mixed with water, and a little wire is twisted to hold the parts in position. Then on the outside of the band, and between the band and the crown plate, flow No. 22-k. gold solder, and then cement the crown, band, and post together in position on the root. When the cement is hard, the crown, band, and post are removed and the band is finished down even with the crown. It is then ready to be cemented upon the root permanently.

Dr. A. J. SAWYER, Manchester, N. H.
 "To Replace a Broken Facing on a Bridge in the Mouth."

Cut or grind off the old pins even with the backing. Then with a drill the size of the platinum pins, drill through the backing at the point of one of the original pins. With a cross-cut fissure bur drill the backing to the depth of the platinum pins, cut a slot to and including the other pin, and with a cone-shaped bur countersink the slot on the lingual side. Now select a suitable facing, the pins of which will pass into the slot. Remove the facing, and with a flat, wedge-shaped instrument pressed tightly between the pins and close to the porcelain, bend the ends of the pins together, and with a file flatten the pins slightly where the ends meet, so that a small piece of No. 18-k. solder can be laid upon them.

Then lay the facing on a piece of asbestos, and with a mouth blowpipe gently heat up and solder the pins together, thus forming a staple, which when the facing is in place will enter the slot and extend into the countersunk portion. The latter is then filled with quick-setting amalgam and the repair is completed.

Dr. G. V. I. BROWN, Milwaukee, Wis.
 "Cleft Palate—Surgical."

Two operations for the surgical closure of cleft palate were performed. One of the cases was that of a boy, two years of age, with a large opening in the hard palate that still persisted after two previous unsuccessful operations for the closure of congenital cleft of the hard and soft palates. The borders of the opening in the hard palate were freshened, and all the tissue loosened from it, including the periosteum as well as the overlying structures. Incisions were made along the alveolar borders of the palate, and the intervening tissue drawn together and sutured in the center. The final result as reported by the physician in charge was entirely successful.

The second patient was a little girl, two and one-half years of age, with a fissure in the soft palate extending nearly through the hard palate, the alveolar portion in front being intact. The same operation as described in the previous case was performed successfully with the complete closure of the fissure. This patient was removed from the hospital the day after the operation and taken to her home in another city. Notwithstanding the fact that conditions for treatment were thus made extremely difficult, a recent report from the physician in charge is entirely satisfactory, a result that under the circumstances is largely due to the faithful post-operative care of Dr. M. C. Smith.

Dr. GEORGE C. AINSWORTH, Boston.
 "A Compound Bicuspid or Molar Filling. Using the Matrix and Soft or Semi-cohesive Gold at the Cervical Wall, Extending Up Two-thirds of the Filling, and Finishing with Cohesive Gold under the Mallet."

The advantages of this method are: Much saving of time and strain upon the part of both patient and operator, besides a far better insurance against future caries at the cervical wall, by virtue of the soft gold used at the points most liable to recurrent decay. It also leaves that part of the filling ordinarily most difficult of access to the finishing process, well-nigh finished, requiring scarcely more than a careful burnishing at the cervical wall. This method has been his constant practice for more than twenty years, during which time he has become more and more convinced that a proper matrix correctly applied is one of the greatest assistants in modern dentistry.

Dr. C. D. BEEDLE, Leominster. "A Bridge, Using S. S. White or Justi Diatoric Teeth for the Facings, and Gold Inlays for the Abutments."

A plaster impression and bite of the teeth are taken with the inlays in place. The inlays are removed from the teeth and placed in proper position in the impression, and a cast made. A suitable tooth is selected, and 22-k. gold, No. 32 or 34 gage, is burnished to the back and into the opening of the diatoric tooth. The inlays are removed from the cast, and slots drilled in them at right angles to the long axis of the tooth, as near to the cervical edge of the inlay as is consistent with strength, and a flat platinum and iridium bar is fitted to the slots. The inlays and bar are then replaced on the cast, and the teeth and backings are adjusted and fastened with sticky-wax. The whole piece is then removed; the inlays and teeth are taken from the bar and backing, which are invested and soldered. The inlays and bar are cemented in place. When hard, the surplus cement is removed and the teeth are cemented to the backing.

Dr. GEORGE T. BAKER, Boston. "Orthodontia, Showing Appliances in the Mouth."

A patient was shown with appliances in position for the correction of positional irregularities of the teeth. The patient

was a boy, thirteen years of age, and the malposition was attributed to three causes: (1) Mouth-breathing, due to adenoids and enlarged tonsils; (2) too long retention of the deciduous teeth; (3) a habit of biting the lower lip.

These combined causes had resulted in an abnormal protrusion of the upper incisors, a contraction of the maxilla and mandible, and a developing retrusion of the lower teeth. The adenoids and tonsils had been excised, and normal breathing was restored. The lower second deciduous molars had been extracted to make way for the bicuspid, which soon erupted. Appliances were made of German silver spring wire for both upper and lower teeth (Jackson). Thus the arches were spread, the upper incisors retracted, and normal occlusion restored. Plaster casts were shown representing the mouth both before and after the treatment. Attention was called to the clean and healthy condition of the mouth, the absence of all inflammation, and the ease and comfort with which the appliances were worn, being easily removed for the purpose of brushing the teeth.

Dr. C. EDSON ABBOTT, Franklin. "Porcelain Inlay in Approximo-incisal Restoration in Anterior Teeth, with Special Reference to Strength."

Patient, Dr. K. Palmer, Mass. The cavity, a large approximo-incisal one in an upper right central, including the lingual pit and embracing one-third of the width of the tooth.

Cavity preparation. The tooth and neighboring territory were thoroughly cleaned and the mouth was sprayed. All decay was removed with sharp burs. A flat cervical seat was obtained with the square fissure burs. A deep depression was cut in the tooth throughout its extent, so as to retain the inlay by a large tongue of porcelain extending throughout the cavity. The margins were shaped and finished with finishing burs, stones, and disks to the utmost smoothness, and at right angles with the tooth-surfaces.

Matrix formation. The matrix was prepared by forcing the center of a large piece of annealed platinum foil, 1/1000,

into the bottom of the cavity with a ball of cotton. The cotton was removed, and the matrix was held in place with a strip of rubber dam and burnished to an accurate fit. The final burnishing being direct on the platinum foil at the margins, made it thinnest at that point, thus giving the best possible joint. The matrix is held firmly with the fingers over the margin, the excess foil is bent free, and the matrix teased out.

Baking. The first bake was a thin film of yellow foundation body; the second bake was of the same material, and restored the dentin of the tooth in color and shape. Two bakes of No. A enamel body finished the inlay, the contour being determined by geometrically projecting the tooth-surfaces shown by the matrix.

Cementation. The matrix was peeled off the moistened inlay, and tooth and inlay undercut with wheel burs and carborundum disk, sprayed and dried, and the inlay cemented in position with creamy Harvard special inlay cement of the same shade as the enamel. The inlay was held firmly in place with springy steel instruments until the cement had hardened, and paraffin was then flowed over the completed operation.

The special point of novelty in the operation is the retention of the matrix in the cavity with strips of rubber dam, which hold it firmly against the margins at all points, preventing tears and distortion, and allowing perfect vision of the cavity, and a slight rounding of the incisal margins of the tooth and inlay with disks before setting. The cavity was made with a joint square across the cutting edge, and with a slight half-round groove between the enamel plates made by a small finishing fissure bur held parallel to the long axis of the tooth. All incisal margins being rounded, the blunt margins resist wear, and although in appearance like the tubercle of a tooth, yet show no break in the continuity of appearance, and in addition the joint is somewhat sheltered from direct stress.

I would recommend a trial of the principle of the blunt margin method in margins exposed to the stress of mastication.

Dr. I. J. WETHERBEE, Boston. "Tin and Gold."

Dr. Wetherbee's clinic consisted of a combination tin and gold filling in a mesio-occlusal cavity of a bicuspid tooth.

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Meeting, Atlanta, Ga., September 18-21, 1906.

General Sessions.

TUESDAY—*First Session.*

THE tenth annual meeting of the National Dental Association was held at Atlanta, Ga., September 18 to 21, 1906, in the ball-room of the New Kimball House.

The first general session was called to order at 10 o'clock Tuesday, September 18th, by the president, Dr. M. F. Finley, Washington, D. C.

Rev. Dr. Junius W. Millard, Atlanta, Ga., invoked divine blessings on the deliberations of the association.

The President then introduced Governor J. M. Terrell, who delivered the address of welcome to the association.

Following the address of the Governor, the President of the association, Dr. M. F. Finley, introduced Dr. D. D. Atkinson of Brunswick, Ga., who delivered an address of welcome on behalf of the dentists

of the state of Georgia; at the close of which,

The response to both addresses on behalf of the National Dental Association was made in felicitous terms by Dr. B. Holly Smith of Baltimore.

At the close of Dr. Smith's address the Executive Council made a brief report through its chairman, Dr. H. J. Burkhart of Batavia, N. Y., upon some matters of business routine and announcing the reading of the President's address, to be followed by the reading of a paper by Dr. C. S. Butler of Buffalo, N. Y., as the program for the meeting as then in session. This report of the Executive Council having been formally adopted,

Dr. Frank Holland, Atlanta, Ga., vice-president from the South, was called to the chair, and the president, Dr. M. F. FINLEY, read his annual address, as follows:

PRESIDENT'S ADDRESS.

The pleasant privilege of welcoming so large a number of professional brethren to this the tenth annual meeting of the National Dental Association is a source of extreme gratification to me.

The warm-hearted greetings from the chief executive of this state and from a local professional brother, voicing the sentiments of this community, which ranks so high commercially, politically, socially, and educationally, ought to inspire us to be faithful and earnest in our work while here, to measure up to the full standard of our obligations in seeking out the truths of nature and science and promulgating them for the benefit of humanity. Your very presence means that such will be the case, for only those devoted to the best interests of their profession will make the sacrifices necessary to attend such gatherings.

I congratulate you all upon this auspicious occasion in that so many are here, and that so many are to take part in the program of papers and clinics; such labors indicate a genuine love for the profession of dentistry, the profession you have chosen for your life-work and which is surely worthy of your best efforts.

On behalf of the National Dental Association I take great pleasure in extending to you all a most hearty welcome and a cordial invitation to participate in the deliberations of this meeting. This occasion is one that I cannot let pass without again voicing the strongest sentiments of appreciation of the honor with which this great association invested me in Buffalo last year, and without again sincerely thanking you for the confidence thus manifested. For twenty-seven years my name has been on the rolls of this association and its predecessors, and thus it has been my privilege to know the great lights in dentistry of that period—which knowledge has been to me a constant source of inspiration and pleasure. This association and its predecessors have made enviable records in history through the efforts put forth in their name.

With these influences as incentives it has been my earnest desire and utmost endeavor to fulfil the obligations of this high office with truth and justice as guides. I realize the limitations placed upon human individual effort, and, so doing, have sought advice and counsel from those more experienced before taking action upon any matter which came to my notice.

Since the Buffalo meeting a series of important events have occurred demanding deliberation and action to which I will now invite your attention. The first matter requiring consideration was in consequence of the prevalence of yellow fever in the ports of the southern states last summer and fall, and a request came from members and officers of the association for a change of date of the Atlanta meeting to avoid what seemed a danger for a meeting to be held in the South in September. A postal-card vote was suggested to make the date of meeting in October instead of the date fixed by vote of the association at Buffalo.

To remove the necessity for a change of date, which is always so disastrous to the attendance on such occasions, I determined to seek information and advice from the Public Health and Marine Hospital Service, and forthwith wrote to the

Surgeon-general of that service and received the following reply:

TREASURY DEPARTMENT, WASHINGTON,
November 27, 1905.

DR. M. F. FINLEY, President National Dental Association, Washington, D. C.

Sir,—The Bureau is in receipt of your communication of November 25, 1905, requesting to be informed, in the interest of the dental profession, whose National Association meets in Atlanta, Ga., next September, what the probabilities are for a return of yellow fever next summer in the ports of the southern states.

In reply, you are informed that while there is always a possibility of a recrudescence of the disease, the Bureau does not regard a recurrence of the fever as a probability, and measures are now being taken and will be continued throughout the winter to prevent such a contingency. While not assured of the success of such measures, the Bureau has faith in their efficacy.

Respectfully,

A. H. GLENNAN,
Acting Surgeon-general.

This reply was communicated to those who had written me about changing the date of the meeting, and was the assurance needed to quiet anxiety and settle that point.

Another matter of great import was the appalling disaster which befell San Francisco and other near-by cities of California when the earthquake and fire made such havoc.

Communications both by wire and by mail reached me from the chairman of your Executive Committee and Executive Council, suggesting a contribution from the funds of this association to aid our suffering professional brethren. After considerable correspondence with other officers of the association to ascertain the amount of funds available, an order for \$250 was drawn on the treasurer, to be sent to Dr. Leander Van Orden, San Francisco, secretary of the Dentists' Relief Committee, to assist the distressed in our profession. Indorsement by the association of this action is hoped for. Also, after consultation among the members of the Committee of Fifteen of the Fourth International Dental Congress, it was de-

termined to send from the funds of that organization the sum of \$750 for the same object, viz, relief of earthquake sufferers in California. Following is Dr. Van Orden's letter of acknowledgment:

2417 WASHINGTON ST.,
SAN FRANCISCO, CALIFORNIA,
May 22, 1906.

DR. M. F. FINLEY, Treasurer Fourth International Congress, 1928 I st., N. W., Washington, D. C.

Dear Dr. Finley,—Please accept our grateful acknowledgment of the receipt of the most generous gift, \$750, through your hands, from the Committee of Fifteen of the Fourth International Dental Congress. It comes most opportunely, for we have exhausted the money so generously sent from Chicago. While our men are bearing themselves bravely in the face of disaster, we fear that there are some cases of serious distress, which we hope to justly seek out. We will be glad to try to limit the benefaction to ethical practitioners, though every class of us must be impressed with the deep-down satisfaction that comes only from generous, unselfish fraternal co-operation. We can only hope that the great geographical distance of California will be offset in the future by the short road of fraternal effort, and that our memories may be long ones. We will gratefully acknowledge the donation from the National Dental Association.

With personal appreciation, I am

Yours sincerely and hopefully,

LEANDER VAN ORDEN.
Sec'y Dentists' Relief Committee.

Again: Information was brought to my attention, in rumors, of a determination to supersede the National Dental Association by organizing another association of a national character, or reviving one of the old associations to which the National Dental Association succeeded.

After careful thought, consultation, and advice, it was determined to incorporate the National Dental Association as successor to the American Dental Association and the Southern Dental Association, in order to protect this organization in its rights and perpetuate it for the good it had done and might hereafter accomplish. Herewith is the document setting forth that action:

**CERTIFICATE OF INCORPORATION OF THE
NATIONAL DENTAL ASSOCIATION.**

The undersigned, MARK F. FINLEY, J. H. LONDON, and W. N. COGAN, all being of full age, citizens of the United States, and residents of the District of Columbia, desiring to associate themselves and the present members of the unincorporated society known as the "National Dental Association" (successors of the unincorporated societies known as the "American Dental Association" and the "Southern Dental Association"), in the formation of an incorporated society, for the purposes and objects hereinafter set forth, do hereby certify as follows:

First: The name by which this incorporated society shall be known in law shall be THE NATIONAL DENTAL ASSOCIATION.

Second: The term for which this society is organized shall be perpetual.

Third: The particular business and objects of this society shall be to cultivate the science and art of dentistry and of its collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse and good feeling, and, collectively, to represent and have cognizance of the common interests of the dental profession.

Fourth: The number of its Trustees, Directors, or Managers, for the first year of its existence, shall be sixteen (16), who shall be divided into an Executive Committee, consisting of nine (9) members, as follows, to wit:

J. D. PATTERSON, of Kansas City, Missouri.
C. N. JOHNSON, of Chicago, Illinois.
H. B. McFADDEN, of Philadelphia, Pennsylvania.
V. H. JACKSON, of New York, N. Y.
C. J. GRIEVES, of Baltimore, Maryland.
W. N. COGAN, of Washington, D. C.
C. S. BUTLER, of Buffalo, New York.
G. V. I. BROWN, of Milwaukee, Wisconsin.
T. P. HINMAN, of Atlanta, Georgia.

And an Executive Council, consisting of seven (7) members, as follows, to wit:

H. J. BURKHART, *Chairman*, of Batavia, N. Y.
J. Y. CRAWFORD, of Nashville, Tenn.
CHAS. McMANUS, of Hartford, Conn.
F. O. HETRICK, of Ottawa, Kan.
E. K. BLAIR, of Waverly, Ill.
M. F. FINLEY, of Washington, D. C.
A. H. PECK, of Chicago, Illinois.

Fifth: It is hereby particularly provided that all present permanent members of the unincorporated society known as the National Dental Association shall be considered as permanent members of this incorporated society, known as the National Dental Association, and shall be entitled to all the privileges

of the class to which they belong, without further action.

Sixth: The above-named incorporated society shall have no capital stock.

Seventh: The present Constitution and Rules of Order of the unincorporated society known as the National Dental Association are hereby adopted as the Constitution and Rules of Order of the incorporated society known as the National Dental Association, in so far as the same are not in conflict with any law now in force enacted by the Congress of the United States.

Eighth: The officers of this incorporated society shall be the present officers of the unincorporated society known as the National Dental Association, and all committees elected or appointed by the said National Dental Association, at its last annual meeting, held in the city of Buffalo, state of New York, on the 25th, 26th, and 27th days of July 1905, shall be considered the officers and committees of this incorporated society known as the National Dental Association, until their successors shall be elected or appointed, in accordance with the Constitution and By-laws.

In witness whereof, we have hereunto set our hands and seals this fifth day of March, A. D. 1906.

(Signed) {	MARK F. FINLEY.	[Seal.]
	J. H. LONDON.	[Seal.]
	W. N. COGAN.	[Seal.]

CITY OF WASHINGTON, } ss:
DISTRICT OF COLUMBIA. }

I, Mason N. Richardson, a Notary Public in and for the District of Columbia, do hereby certify that Mark F. Finley, J. H. London, and W. N. Cogan, personally well known unto me as being the parties who executed the foregoing and annexed Certificate of Incorporation of the National Dental Association, personally appeared before me, in said District, and acknowledged the same to be their act and deed, and the act and deed of each of them.

In witness whereof, I have hereunto affixed my official seal, this fifth day of March, A. D. 1906.

(Signed) MASON N. RICHARDSON,
[Seal.] Notary Public, D. C.

Further: False criticisms of the work of one of the most important committees of this association were made, published, and circulated, in an effort to defeat the very purpose for which this committee was called into existence and for which it had so assiduously labored.

Resolutions have been passed by this association directing that all matters pertaining to the work of legislation should be transacted through this same committee. Had those criticisms been left to stand, and those making and circulating them left to pursue their plans, the work of this important committee, which had been ably supplemented by some of the best men in the profession and by the authorities of the best educational institutions of the country, would have been nullified and the profession's dignity belittled and degraded.

Consequently, after due consideration and consultation a special committee was appointed to look into and consider all questions involved. This special committee has prepared a report, and at a time to be designated it will be presented to the association.

At the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society held in June, a paper was presented on "Pharmacopeial Revision," by Edward Hoffmeister of Baltimore, which contained a suggestion that the National Dental Association consider the advisability of sending delegates to the next convention for revision of the U. S. Pharmacopeia.

This suggestion seemed to me a good one, and to further the project I wish to present a few items of history. In 1817 Dr. Lyman Spalding of New York city submitted to the Medical Society of the County of New York a project for the formation of a National Pharmacopeia. The first general convention for formation of a National Pharmacopeia assembled in Washington, D. C., January 1, 1820, and published the Pharmacopeia adopted at that convention on December 15, 1820, since which time, at regular intervals, revisions have been made. The membership of the Convention for Pharmacopeial Revision is composed of representatives from the Medical Departments of the Army, Navy, and Marine Hospital Service; medical societies and associations, medical colleges and universities; pharmaceutical associations, colleges and universities of pharmacy.

The dental profession has so far advanced, and is so interested in the questions to come before this convention of revision, that I determined to write to the president of the U. S. Pharmacopeial Convention to ascertain if delegates would be received from the National Dental Association in the next Pharmacopeial Convention. Following is a reply:

LONGPORT, N. J.,
July 25, 1906.

DR. M. F. FINLEY, President, 1928 I st., N.W.,
Washington, D. C.

Dear Sir,—Your letter of July 12th has been handed to me for reply, Dr. H. C. Wood, president of the U. S. Pharmacopeial Convention being out of town on his vacation at Rangely, Me.

The next convention for the revision of the U. S. Pharmacopeia will assemble in the city of Washington on the first Monday of May 1910. My personal opinion is that the National Dental Association delegates would be given a welcome at the convention, with the privileges of the floor. I think it would require a resolution passed by the convention to receive the delegates as full members. I would advise writing to the president of the convention, Dr. H. C. Wood, about January 1910. He will probably authorize the appointment of delegates from your body.

Very truly yours,

JOSEPH P. REMINGTON,
Chairman Committee of Revision.

I would suggest that this association seriously consider this opportunity and prepare to send delegates to the convention.

Since our last meeting the Transactions of the Fourth International Dental Congress have appeared, and are a glorious monument to the credit of this association, which authorized and fostered that congress. The publishers should also be congratulated on such splendid work as is manifest in the make-up of those three volumes.

A full and final report of the Committee of Fifteen, which had in charge the organization and conduct of this great Fourth International Dental Congress, will be made at this meeting, every detail of the work intrusted to that Committee having been completed.

ARMY MEDICAL MUSEUM AND LIBRARY.

Especial attention is invited to the valuable exhibit pertaining to dentistry, in both the Army Medical Museum and Library, and again, I would urge every member of the association to make contributions, to this vast storehouse, of specimens which are of value and which otherwise may be lost to the profession—where they will be made of permanent benefit by their proper arrangement, display, and care, and will be a source of education, and will also in a most distinct way enable dentistry to make a record comparable to that of medicine.

The record already there is due to the earnest efforts of the committee of this association, whose hands should be strengthened by more and better support from the entire membership. I would suggest a revival of the effort by this association to induce Congress to appropriate for and establish the position of dental assistant curator in that institution. This plan was tried several years ago, and, with proper effort now, it is my opinion that our profession would be recognized at this time by Congress to that extent. Such a position would afford wonderful opportunity for research work in many directions, and annual reports could be made which would stimulate and arouse zeal in the profession.

In the National Museum, an institution adjoining the Army Medical Museum and Library, there is also great opportunity for research work in both medicine and dentistry, but advantage is not being taken as it should be by the professions, of the available material the government is there collecting and arranging. Through an introduction by Dr. Bogue to an official there, it has been my privilege to note the possibilities for enabling valuable knowledge to be dug out of those collections, in a direction other than the course which those in the employ of the government are now pursuing. It is my suggestion, also, that this association establish a chair or found a professorship in research work in these government institutions, and make it permanent by appropriating a fixed sum

therefor, believing that in so doing we will make a record to the everlasting credit of our association and our profession. Repeatedly have the members of the dental profession in Washington, D. C., conducted members of this and other societies through the above-mentioned museums and library, and in the interest of progress have endeavored to spread as broadly as possible the knowledge of the usefulness of the collections there accumulating.

COMMITTEE ON HISTORY.

This association is to be congratulated on the success which has attended the efforts of its Committee on History, which has, in the interim since our last meeting, offered to the members a volume of valuable historical interest to the profession. The membership should show their full appreciation of this committee's efforts, by quickly responding to the appeal which has been made for funds to publish this work. In fact, better and more unanimous and more unselfish support should be given to every committee of this association in their work if true progress is to be made in dentistry, and if that progress is to accomplish the most good that can be made of it. Your committee on History further states that when this first volume is successfully published, a second and companion volume will be issued, treating of the more modern aspect of dentistry. How essential, then, that we come forward generously and place the sinews of war in the hands of our hard-working Committee on History.

COMMITTEE ON ORAL HYGIENE.

I cordially indorse the work of the Committee on Oral Hygiene, which has labored assiduously since its first establishment. A very interesting and valuable presentation of material for your consideration will be made at this meeting, and a solution is offered to the problem which has been uppermost in the minds of the leaders of the work of this committee, by a resolution to be offered and which was placed on the program

that all might see it and be favorably impressed by it. The resolution is as follows:

RESOLVED, That the National Dental Association authorize their Committee on Oral Hygiene to formulate and publish a "first edition" of a treatise on Oral Hygiene for the public; the total cost of compilation and publication to be not more than \$250.

I recommend that this resolution be adopted after the Committee on Oral Hygiene has made its presentation, as I think it is a step in the right direction which has too long been delayed. The chairman of this committee has offered to undertake the compilation of this treatise for love of his profession, which simply leaves the cost of publication to be borne by this association.

COMMITTEE ON ARMY AND NAVY LEGISLATION.

The association is more or less familiar with the work of this committee, which was first appointed at Omaha in 1898, and which has labored in season and out to obtain a proper recognition by the government in its military and naval services of the profession of dentistry, in the establishment of a dental corps with rank and right of promotion and retirement. A full and succinct account of the efforts of this committee will be presented to you in the report of its chairman.

DENTAL JOURNAL.

If a plan shall develop at this meeting to start a journal of the association, a consummation devoutly to be wished, I would favor the idea of our making a separate contribution of one dollar, in addition to the dues of the association as they now stand, for the support of the journal. This would instantly place a considerable sum at the disposal of a committee of publication, and would also make a legitimate list of subscribers to aid in securing postal concessions. Further, it would be my idea that the journal should be entirely owned and managed by this association, with no partnership arrangements with other associations or societies.

SECTIONS.

The question of how best to arrange the work of the sections to meet the demands of our membership has been a serious proposition for a good many years, and has been alluded to in the annual addresses of former presidents, and has been handled by the committees of revision of the constitution many times. It certainly would be advantageous if the opinion of this association could be made unanimous as to a final plan of procedure. To avoid some of the objections of the simultaneous meetings of the three sections, your Program Committee this year ask your co-operation and earnest assistance in the trial of the scheme of one section at a time, and the sections alternating instead of being in continuous session, thus avoiding the possibility of one of the sections not being reached at all, as was the case in the American Association.

I will repeat what appears in the announcement of the program. It is deemed wise by the Program Committee—in consequence of the seemingly prevailing sentiment that all papers be read so that the entire membership shall have an opportunity to hear and discuss them—to so arrange that only one section will be in session at a time; and, to make the plan feasible, an appeal is made, first, to essayists, to make their papers concise, crisp, and limited in length; secondly, to all those taking part in the discussions, to make them concise and crisp—to the end that the entire program may be carried out, thus giving to those who have been sufficiently interested to prepare papers an opportunity to read them and have them creditably discussed.

To make the discussion more general and give it direction, a synopsis of several papers was printed in the program for the benefit of those most interested in the subjects handled, and I would recommend that it be the policy of the association in the future to print a synopsis of all papers in the program. There will be sufficient time allowed for carrying out the program, so that each section will

have two sessions of at least three hours' duration, which should be ample time to compass the work mapped out if the members will be prompt in attendance, and will show an interest and make concerted effort to assist the committee.

Just here let me acknowledge with extreme gratitude, the very generous and hearty assistance and support of section and committee officers in securing and arranging the scientific matter for the program, and the same character of assistance and support from the general officers and committees, in arranging the details of preparation for carrying out the work of the convention, and likewise from the membership in all that has been done in the interest and welfare of this meeting of the association—all of which will help toward the general elevation and upbuilding of the profession in its various ramifications.

MEMBERSHIP.

In the interest of increasing the membership of this association, which is sadly in need of arithmetical or geometrical progression in order to make the figures commensurate with the number in the profession which it represents, I would recommend a change in Section I of Article IV of the Constitution, which reads, "Any permanently organized state dental society may send one for every six of its active members as delegates," etc., by eliminating the words "one for every six of"—making it read, "Any permanently organized state dental society may send its active members as delegates," etc. I suggest this in the belief that it will stimulate an interest on the part of different state societies in this association. There is a committee of this association on state societies, and it would seem to me that with the limitation removed as to representation from those societies, there might be some rivalry engendered, which would encourage an increase in delegates; and I would further suggest, that a prize in the shape of a medal or certificate be offered to the state society sending the largest number of new members as delegates each year.

It is with very great regret that I note the absence of so many of our members because of unfortunate circumstances—such as sickness, calamities by earthquake and fire, and the wrecking of financial institutions—who, but for the interference of these untoward events, would be among us battling for the success of this meeting. I can but note with sadness and regret the removal from our midst, by Divine Providence, of so many of our faithful, conscientious, and devoted workers, whose remarkably lovable traits of character displayed upon all occasions were so lavishly manifested toward those who were fortunate enough to enjoy the acquaintance of these departed ones. I must mention by name two at least, with whom I have been so intimately associated for a goodly number of years in the work of this body—Chas. C. Chittenden and J. A. Chapple, as to whom it can be justly said that we are each of us better for having known them. The latter of these we had all looked forward to the pleasure of meeting at his own home, where alone the true genius of the man was displayed to its full capacity. We here offer our sincere tribute to all those who have left us since our last meeting, and deposit upon their tombs a wreath of perpetual remembrance; and we also hope that through spirit communication they may be made aware of the genuine manifestations of regret at the loss those who remain have sustained.

But, to come back to the duties before us, we are assembled for a specific purpose, each with a task assigned—to do the utmost for the elevation and upbuilding of the profession of dentistry. By always maintaining the truth and actuated by motives of justice, striving to conform to the tenets of the code of ethics, in the hope of seeing this profession, through its membership, constantly moving upward and onward in the scale of development, are we encouraged to the belief that right will prevail, that success will attend our efforts, and that dentistry will attain to the high ideals set for it by the most sanguine devotees in the profession.

Dr. B. HOLLY SMITH. I move you, sir, that this address be referred to a commit-

tee of three to report to the association on the recommendations therein contained.

The motion was carried.

Dr. Holland appointed as such committee the following: Dr. B. Holly Smith, Baltimore; Dr. John I. Hart, New York, and Dr. H. B. Tileston, Louisville.

Dr. Finley resumed the chair and introduced Dr. CHAS. S. BUTLER of Buffalo, N. Y., who read a paper entitled "The Educational Problem," as follows:

THE EDUCATIONAL PROBLEM.

I have prepared this paper on the Educational Problem at the earnest request of the chairman of Section II, and in its presentation shall offer for your consideration four propositions, the combination of which, in their working out, is designed to effect a complete though perhaps not a perfect change in our entire educational system.

(1) The abolition, by gradual absorption and elimination, of all our present schools, and the substitution therefor of departments in strong universities, with faculties selected by the profession itself, and for which each teacher shall be chosen with due consideration as to his known fitness to fill the position he is to occupy.

(2) The abolition of state examining boards as being superfluous and of doubtful utility in any system of professional education.

(3) The creation of a national commission with plenary powers in regard to location of the schools, curriculum of study, and entrance requirements, as well as general oversight of their affairs.

(4) The diploma of said schools, when granted in course and indorsed by the national commission, to be accepted as a license to practice in any state or territory of the United States.

When, in 1839, men desiring facilities for adequate instruction in dental subjects were denied admission to medical schools, and their suggestion of a dental science was spurned with contempt as being beneath the dignity of men in charge of those institutions, the great science of medicine and surgery was set

forward to a degree not easily understood by any at that time, and scarcely realized or appreciated by us today; for it is to the enforced establishment of separate and independent schools for teaching dentistry that is due in large measure the development of microscopy and the marvelous advance in our knowledge of histology, pathology and kindred sciences, as well as the wide application of antiseptics—for it was men engaged in the study of dental sciences who led the way and gave the impetus to their development. To it also may be traced the wide introduction into the curriculum of our public schools, of a system of manual training, the application and thoroughness of which is preparing as never before a generation of youths to enter upon a life-work of usefulness and profit. But great and far-reaching as these have been, its greatest influence, undoubtedly, has been in leading to the development of a system of dental instruction, peculiar to itself and in some ways not surpassed in efficiency in any other field of intellectual activity.

But notwithstanding its efficiency and apparent thoroughness, it is a serious question whether its limit of proficiency has not been reached; whether, indeed, there has not been a marked retrogression in the results of its operations during the past five years or more. To one who has been a close student for more than a quarter of a century, and always deeply interested in everything pertaining to our educational matters, this seems to be true; or to state it in another way—that our entire educational fabric is falling apart under the stress of its own weight. But, be this as it may, it certainly is true that the time has fully come when the profession itself should lay hold of this whole question seriously and with a determination to put our educational affairs on a plane relatively as high as that of the other learned professions. To do this some radical change of methods must needs be adopted; the number of the schools should be gradually reduced, and the quality and character of those remaining greatly enhanced. This may be done in two ways, but preferably, perhaps, by a gradual elimination of those schools now

in existence by their combination with and absorption into departments in strong universities centrally located in different sections of the country, thoroughly established and well grounded in the true university spirit, and in the midst of large and prosperous communities.

Those of you who have observed closely the trend of educational matters during the past half-dozen years must have been impressed with two things—first, the inability of our present system to meet the demands of the profession; and secondly, the unmistakable tendency toward university departments in the schools themselves. That these things are observable is matter for congratulation, as at least showing a disposition on the part of the schools and of the profession to be dissatisfied with present conditions, and is a healthful and encouraging sign. It is a new spirit with us, and should not be repressed or discouraged; on the contrary, we should welcome it and seek to direct its energy. It does not follow that because men are dissatisfied that they are disaffected. All reforms and changes are awakened by dissatisfied men, but by disaffected men, never. This trend toward university departments, therefore, awakened by men dissatisfied with present conditions, is evidence of their own earnestness, and is readily explained and easily understood when the alliance is sought with universities where all of the departments are under one general management, where all of the teachers are employed at fixed salaries, and where the funds are used for the symmetrical development of the whole university.

The advantages growing out of an alliance of that character are so obvious that no institution concerned at all in its own welfare could afford to neglect it. But if it were possible for all our schools to be thus situated, which of course it is not, even then not all that is needed by the schools or is demanded by the profession could be realized; so that, while we may congratulate ourselves on this manifestation of a desire for better things, we cannot rest satisfied with this alone, even though it does offer advantages not easily obtainable by schools otherwise

situated. The community of interests necessarily existing in the several departments of a university—the interdependence of these departments, but more particularly the “fraternity spirit,” which means so much and which is so difficult to define or understand, and which can be developed in its highest and best sense only amid such surroundings, are some of the indispensable conditions necessary in the building up of schools of the highest efficiency and usefulness. Educationally speaking, we do not appreciate at its full value the true fraternity spirit. This is not strange; we see so little of it, for it is only to be found amid real university surroundings.

A recent writer in one of our magazines, speaking of Oxford, said: “This fraternity spirit is one of the greatest benefits to be derived from this old university. While it is not tangible or visible, nevertheless it is a living reality, and its potent force can be readily felt. It is a subtle influence, which enthuses one and gives him that true love of knowledge which at once marks him as a scholar. It wears down rough positiveness, softens the severity of prejudiced criticism, and cultures and refines thought—that is, true intellectual thought.”

Under our present system, if there be any one thing more pronounced than another, it is that “rough positiveness” here referred to, for our entire educational training, as well as our professional practice, is made up almost wholly of dogmatics, and it is only by widening our intellectual horizon, through the medium of a truer appreciation of the value of the interdependence one upon another of the various departments in great universities, that we as a profession can hope to grow.

No profession can live unto itself alone, and continue to live. If it try to do so it will inevitably become, sooner or later, a dying profession. It must yield something for the general good, and it cannot retain the good it has already accomplished without striving for more. “In the lives of professions as in the lives of men, there is no level place, nor is there any brake to hold them at rest on

the slopes where they are set." They must climb or they must slip. To mount or to fall, to grow or to decay, to grasp more of the spirit of progress or less, more of personal self-sacrifice or less—these are matters of choice; but we must choose, and upon the choice we make will depend, in large measure, the future advancement or certain decay of our profession.

The growth of a profession, like the growth of general education, is a part of development of the whole intellectual life of the nation; and that nation grows best which harmoniously and aggressively identifies itself with the educational needs of its people. It is in the recognition of this law of the intellectual growth of the nation—or rather, the recognition of the needs of a people in their intellectual development—that the foundations of our universities are laid; a fact which we, though one of the younger of the professions, should be quick to recognize and appreciate.

Other and very marked advantages accruing to these departments would be found, not only in the curtailing of the number of schools, but also in the superior equipment, enhanced facilities by reason of location, environment, etc., and not the least of all in the concentration of patronage, thereby affording advantages not usually recognized, namely, in the stimulus to both teacher and pupil that comes with large numbers. It must always be remembered that it not infrequently happens that the very best work in any school is done by the individual teacher with the individual pupil, but yet it should not be forgotten that the stimulus and encouragement that come with well-organized and flourishing institutions, where all the activities are running at flood tide, are far greater than with small, struggling, and oftentimes poorly equipped schools, no matter how high their ambitions or how honest their intentions. But the great problem to be worked out in this proposed change is not the recognition and utilization of the advantages accruing from its adoption, but how best to appropriate and assimilate all that is worthy and of value in our present schools. They all have vested interests

which must be conserved, and of which each and all will be required to yield something for the general good. Just how this is to be accomplished is matter for future consideration. It is no part of the purpose of this paper to discuss that phase of the question, beyond saying that a fair and a workable solution of it is certainly within the bounds of reasonable probability.

(2) *As to the abolition of State Examining Boards.* In any system of professional education, examination, as by our examining boards, placed upon the products of the schools from without, is unnatural, indicating lack of confidence, if not actual distrust and condemnation. The examination and oversight by the profession should be placed upon the schools themselves, and should be so effective that it would be impossible for vicious and incompetent men to be graduated. This would at once eliminate any possible or fancied necessity for state examining boards, the existence of which has been a direct censure upon our entire educational system. These boards, through the influence of their national association, have done much to lower the standards and to bring the dental degree into disfavor both at home and abroad, besides harassing many of the schools, without accomplishing any useful purpose.

To some this may seem like a harsh criticism, and particularly so when we recall the many earnest, unselfish, and devoted men who have been active in the work of that association, and who have always intended and desired the very best, both for dental education and for the profession itself. The criticism is not of the men, but of the false conception on which the association was founded, and the fancied functions it was assumed that it had to perform. It is possible that had the association confined its efforts to the work of organizing and building up the state boards, perfecting and unifying methods of examinations, and in ways that were legitimately possible encouraging and assisting the schools in the real business of education, instead of attempting to dictate as to their internal man-

agement and to prescribe their standing and reputability, its field of usefulness might have been enhanced, education advanced, and its formation and existence seemingly justified. I say "seemingly justified," by which I mean under our present system.

But all this as touching the National Association of Dental Examiners has really no place in this discussion, and I have introduced it here only for the purpose of making clear the unscientific and unbusiness-like conditions under which our students are trained.

(3) *As to the creation of a National Commission.* The desirability of such a commission and something of the functions it might legitimately assume have already been hinted at, and it is only necessary to point out specifically its special field of usefulness to make its importance, in any system of education such as ours, at once apparent. And first of all—and this undoubtedly would be its greatest work—would be the preparation and adoption of uniform equipments, uniform preliminary requirements, uniform curricula of study, and uniform intermediate and final examinations as to proficiency—this for all the schools, and as a basis upon which to begin the erection of a modernized system of education that would be commensurate with the needs of our profession. To these also would be added a general superintendence or oversight of the schools, with authority to veto unworthy faculty appointments, and the right of review of all graduation examinations, etc.

(4) *The diploma, when indorsed by the National Commission, to be accepted as a license to practice in any state or territory of the United States.* This would at once invest our degree with a dignity and value not possessed by any other profession. It would also prepare the way for the acceptance of a universal degree, and would become a strong, stimulating force in building up a system of education for our students which should equal that of any of the learned professions, and at the same time widen the scope of individual usefulness of all our members.

The training of the human mind,

whether in primary or secondary education, has ever been deemed the highest duty and privilege of man, and the greatest intellects and first scholars of every age have not deemed it derogatory to their dignity to devote themselves to its consideration, and have ever held it to be the highest duty of the state and nation to provide liberally for the care and development of the people in their physical, moral, and intellectual life.

"Educate the people" was the first admonition of Penn to the colony he had founded. "Educate the people" was Washington's richest legacy to the nation. "Educate the people" was the unceasing exhortation of Jefferson, whose last years were concerned chiefly in establishing in Virginia a system of public instruction, the fruits of which are seen in her splendid institutions of today. So too with the arts and sciences. From the earliest days, liberal provision by the state and nation has been made for their establishment and maintenance at government expense. Astronomy, geology, and climatology, not to mention their kindred sciences, have received substantial encouragement and support from the public treasury. Not so, however, with the great science of medicine and surgery. From the days of Hippocrates to the present, medical science has fought its own way, developed its own progress, and established its own systems. And especially is this true of our own department in that great science. "Like the spider spinning its web out of its own inwardness," it has developed and expanded, unaided and alone, till it stands today as one of the foremost professions of the world. The great problem of education, of whatever character, has ever been, and still is, to secure in due proportions instruction and the development of the mental faculties. It is this which constitutes the chief difficulty, both in the common education of childhood and the special education of later life.

The human mind can be trained only by facts imparted to it, and the first object of all teaching is to so impart facts as to educate the mind in scientific thought that it may be able to found a judgment on the facts presented. To ac-

cept as true all that established authority says is true, or to fill the mind with such statements by an effort of the memory, is false teaching, since by it the mind may become stored with error instead of truth. To determine that which is true or false, and to arrive at just conclusions, is of far higher value than a mere memorizing of facts, and should be the primary and ultimate object of all teaching. "And to thus teach," says Dr. Watts, "the instructors should not only be learned in the sciences which they teach, but have skill in the method of teaching, and patience in their presentation."

No intelligent man doubts for a moment that one hour's teaching by an expert is far more valuable to a pupil than two hour's instruction by a mere routine teacher, or that truths are far more effectively taught by those who have been tempered for their work by the glow that comes from a growing insight into some chosen mental field, and who know what devotion to truth for its own sake means. It is men thus trained and disciplined that are desired as teachers in our profession. Not that many of those hitherto and at present connected with our institutions of learning are not men of experience, education, and devotion; they certainly are all of these, and deserve the highest commendation and respect for what has thus far been accomplished through their efforts and skill; but who of them all is not required to divide his time, energy, and thoughts between his daily practice and his hours of teaching?—between a necessity for bread and a desire to impart knowledge?

It has been truly said that no artist, however skilful, who paints his pictures for so much apiece, or who is required to paint that he may live, can produce his best results. His must be a labor of love; he must be above financial necessity; his mind and energies must be given without pollution to the study of the true science of his art, if he is to exercise and display his greatest genius. And what is true of the artist is equally true of teachers and institutions. Any system of education which does not keep men constantly at

their best work is unbusiness-like and wasteful; and who can estimate the loss already sustained, in that Miller, Black, Williams, Andrews, Truman—not to mention scores of other equally conscientious though perhaps less-known workers—have been unable to give themselves wholly to study, investigation, and instruction?

That the agitation for higher dental education and improved facilities for acquiring it is to become widespread and permanent, I fully believe. That it will also receive opposition and discouragement is safe to predict, for there are always those who, while not openly opposed to a forward movement, nevertheless do not accord to it the encouragement and support necessary for its accomplishment.

Among the many fallacies of the day that pass unquestioned there is none more fallacious than that change is popular. The truth is, he who seeks to alter the established order of things is likely to be, for a time at least, the most unpopular man in the community. He will be hated by those who are satisfied with the old evils; he will be disliked by the timid and lazy, who dread the perils and troubles of a change; and he will receive little encouragement from those most conscious of the evils, because his remedies will not act as a charm and remove in an instant the accumulated ills of centuries. We are not always conscious of the fact that in man the love of ease is far superior to the love of change. In the serious concerns of life, change is never desired for its own sake; habit becomes second nature, and it is only by the positive pressure of evil that we are driven to any reform. An old system must ever have two advantages over a new one—it is established and it is understood. We ought not therefore to be over-anxious to encourage a change in case of doubtful improvement; but in undertaking to bring about an improved condition in our educational system we are seeking that which will confer upon our profession and humanity benefits which cannot be properly estimated.

We are living in the present, but we must think in the future, and strive to

build for those who are yet to come. The present becomes the past, and the future the present, in such rapid succession that the man who in any of the serious concerns of life does not think and live in the future, is certain sooner or later to find himself hopelessly in the past. And what greater incentive is there than this knowledge to awaken in us an irresistible desire and earnest purpose to lay broad and deep the foundation of that system which underlies all other systems—namely, the system which educates our students, and determines the character of the education which they receive?

Years undoubtedly will be needed for its complete accomplishment; but the gain of a little here and a little there, and the aggregate brought together into one complete, uniform, homogeneous whole, in which each and all are striving to encourage and assist in every honorable way, must eventually result in educational facilities for our profession which shall, in a larger measure, meet our peculiar needs.

Discussion.

Dr. CHARLES McMANUS, Hartford, Conn. The thing that strikes me most forcibly in the paper is that it is a radical study of the educational question presented in a very high-minded way. In the consideration of this subject, it is of course necessary to deal with several classes in the profession: those connected with the colleges, those connected with the boards of examiners, and perhaps a third class, which comprises what we may call the plain dentist, to which class I sometimes ask the privilege to belong, although, as Mark Twain said, I have friends in both of the other classes.

Evolution, of course, is something which looks to the future. It is certainly a fact that in the past many of the older colleges have had to depend for their strength largely on the personality of the great men connected with them; but possibly in the future, when our colleges will have become departments of the great universities, this will not obtain so generally.

As to dental examiners, I believe that there are some of them unworthy of the name. It seems necessary that we should have them under the present system; they must be there as a sort of dental policeman, but if our educational system can be placed on the high plane spoken of by Dr. Butler, there will be no necessity for the state dental examiner, and the best of them will be glad to find their occupation gone.

In closing I wish to speak of one particular phase of the paper—that in reference to the men who are dissatisfied but not disaffected; and it seems to me that therein lies the hope of dentistry or any other calling which desires to progress. The man who is dissatisfied is ambitious; he is a constructionist—a builder-up; but the man who is disaffected is what we call a pessimist—one who tears down, and that phrase is the keynote of the paper—that there are so many in the profession who are *dissatisfied* but not *disaffected*.

Dr. S. H. GUILFORD, Philadelphia. Like Dr. McManus, I listened with great pleasure to Dr. Butler's paper, and if I were to criticize it, I should say that the best part of it was the rhetoric and the delivery, and that the poorest part was the ideas it contained. When I say this, I do not mean the general ideas to which Dr. McManus referred, as I think they are commendable. Dr. Butler is reaching toward something in the future; something both great and grand, but when we consider his suggestions as to how to realize these high ideals, I regard them as utterly impractical and impracticable. It is very easy to present ideas and ideals, but we should have some knowledge as to how to bring them about. We should go into details, because without details we cannot hope to have the superstructure we are looking for.

In regard to the problem of eliminating the independent colleges—the small colleges—and establishing others in certain districts, and having them give all the dental instruction, it seems to me that the proposition is very much as though the board of trade in some city should say, "We have too many retail stores in this city. We want to eliminate the

smaller shopkeepers and have only large department stores—one here and one there, readily accessible to the people.” Now, would such a thing as that be practicable? Could we rob the small storekeeper of the privilege of conducting his business to the satisfaction of the people who trade with him? I say it cannot be done. The next question is, Would it be desirable to eliminate the small stores and have the work concentrated in the larger ones? Or, to make a similar application in matters of education, Would it be well to eliminate the small institutions of learning, and have them all concentrated in larger schools of education? I think that in order to decide this question, it would be well to consider what has been done, or what has been tried in other ways. Let us take the case of general education. The question as to whether education is best conducted in large universities, or in the smaller colleges has been a living one in this country for many years. There are two things to be considered in regard to that matter; one is that in the larger institutions there exists a sort of fraternity spirit—that spirit which counts for something. The young man comes in contact with many other young men, he rubs against them and becomes polished, and the influence is a good one. On the other hand, the man who enters the smaller college does not acquire that great spirit that pervades the universities, but he comes into closer contact with his instructors; as the classes are smaller, the teacher gets nearer to the young men, and the personal influence exerted by the teacher over them is important and valuable—far more valuable than that which comes from what we call the university spirit. Therefore, this question has two sides—one in favor of the larger university, and the other in favor of the smaller colleges—and as it has not as yet been settled for general education, I do not think it will ever be settled in our time for professional education.

Now the presumption is, as I take it, that if our educational institutions were incorporated in a few large universities, better results would be attained so far as

teaching is concerned. This plan has not been productive of such results in other professional schools. We have many professional colleges that do not have such a great number of students, but many of the students graduated by these schools become very remarkable men. For instance, in Philadelphia we have the Jefferson Medical College, which is not connected with any other institution whatever; it is not under the supervision of the state authorities, and yet from it are turned out as many eminent men as from any medical school in the country. The teachers are great teachers, and nobody questions their ability or success as teachers. When we come to the question of the fitness of the men educated by the different schools, if you look throughout the dental profession today, select its best teachers and find out where they received their education, you will find that most of them have come from the smaller colleges.

I consider Dr. Butler's ideas with regard to incorporating the independent schools in the universities as impractical. How are we going to bring about this combination? We have throughout the country many colleges—fifty or more, and how were these colleges established? They were established by a number of dental practitioners who were willing to give their time and money for the purpose of founding them and building them up so that proper education might be given to the young men entering the profession. How would you dispose of these men? Many of them have been teaching in these colleges for years, and are dependent on the salary they receive for their teaching. They have given time from their private practices to devote it to the teaching of students, and in many instances their practices have greatly suffered thereby, and in others have dwindled down to almost nothing. Now, what are you going to do with these men? You cannot care for them except in one way, and that way Dr. Butler did not suggest, namely, that we gather together in some mysterious way a large fund to reimburse these men for the sacrifices they have made.

In regard to the question of the boards of examiners, or the interchange of licenses—perhaps I can throw a little light on that subject by illustration. Quite recently I was in Canada, and I learned there what interested me greatly. They have been struggling with the problem of state boards or interchange of licenses, and they have brought about a tangible result. The Dominion of Canada is divided into nine provinces, and they have agreed that its own legislative body shall make the dental laws for each province. They have established in each province a board of examiners, which conducts the dental affairs of that province in the same way as the state boards in this country conduct the affairs in each state. They may adopt a high standard or a low one as they please. When a man wants to practice in a certain province, he must pass the examination prescribed by the board of that province, and if successful he is licensed to practice in that province and in no other. But the boards in these provinces have come together and agreed to form what is known as the Dominion Dental Council. That council is composed of two representatives from each province, being selected by the highest dental organization therein. These eighteen men constitute the Dominion Dental Council. They hold examination at certain places at certain times, and if a man who is practicing in any province wants to appear before that council, he can go there and be examined, provided he has previously obtained a certificate in one of the provinces; and if he passes the examination of this council satisfactorily, he is given a certificate which entitles him to practice in any of the provinces of Canada. There, gentlemen, is a practical result. Now that would be difficult to bring about in our own country because of so many states, and yet they tell me in Canada that in order to get this interchange among those few provinces they have been working for years with the different legislatures until they finally accomplished this result. Though this represents long and arduous work, it seems to me that it is an idea that we might appropriate with advantage, and

in that way overcome some of the difficulties mentioned by Dr. Butler.

Dr. S. L. GOLDSMITH, New York. I think we should hail Dr. Butler as being in the same class with such men as Jules Verne—as a man with a visionary imagination. I think, however, that he is nearer the realization of his ideas than Jules Verne was, because it seems to me that Dr. Butler is going to see his hopes realized during his lifetime.

In speaking of the profession as being divided into two classes—those who are dissatisfied and those who are disaffected—I think he should add one more classification, namely, that of those who are disinterested. The discussions of the men who speak on this subject must be weighed. We must consider what power is behind the throne; what is the power actuating the man, and then we may read between the lines.

The gentleman who preceded me, and whom I have known and respected for many years, has made comparisons between the dental educational problem and the workings of a board of trade. Gentlemen, are you willing to be classified with anything that is commercial? Can there be any comparison between commercialism and professionalism? There should be no competition between colleges except in matters of education. The great trouble with the colleges is the question of being able to pay the professors adequate salaries. They must make the revenues from the clinic room and the students' fees sufficient to meet the expenses of remunerating the professors; and by what right does an association of colleges assume to dictate to its members the fees they shall charge? The only question should be the question of educational standard of the different colleges. Is it in commercialism or in the maintenance of education and professional standards that the National Association of Dental Faculties has an excuse for its existence?

The question of the classes being too large in the larger institutions is simply a question of economics. It is true that if you have very large classes under the instruction of one man, the personal as-

sociation of the professors and students will be less close; but it is possible to preserve that educational feature in large classes by subdividing them into a number of sections each under the supervision of a teacher. No educational institution should be expected to be self-supporting, and in my opinion only such colleges as are fully endowed, and those under governmental care, can lead a useful existence.

Dr. J. V. CONZETT, Dubuque, Iowa. I have nothing but commendation for the paper. It may be true that Dr. Butler's ideals may not be possible of attainment, but nevertheless that is no reason for denouncing them, or for saying that an ideal should not dominate the minds of the profession. It seems to be the best ideal we could have, although it may require many years to reach it, because our system of education must be of necessity a process of evolution. It is true that great things have been accomplished by our present system of education; great and honorable men have been turned out under it by the small colleges; and yet, on the other hand, it is likewise true to a very large extent that the commercial spirit has been fostered by these small colleges. They of necessity must depend for their existence on the fees received from students, and on the receipts from their clinics. Everyone is influenced by his environments, and this is where the student acquires the commercial spirit.

In the state of Iowa we have had three schools, and every man who is not connected with the schools regrets that there should be more than one school. One of them, however, has recently gone out of existence, which I think is cause for congratulation. There should be but one school in the state, and the university school will not be what it should be until the others are eliminated. The small schools do not have the highest class of men, simply because they have to depend on the fees received from their students, and they cannot be as strict as they should be in their requirements for entrance. The small schools must have men because of the dollars and cents they mean to the school; and men have

come to me and asked the standard of preliminary requirements of such and such a school, and after being told have gone to other schools where the standard was not so high, and been accepted. There are many of these men who can do little more than read and write, practicing dentistry in our state today, who have been graduated by the commercial schools, as we call them. While it is almost impossible to eliminate these schools, I believe our efforts should be for elimination as far as possible.

Dr. Guilford has cited the case of the Jefferson Medical College of Philadelphia as a successful professional school not connected with any university. Undoubtedly there are some good schools which are not affiliated with any university, and yet these schools are hopelessly in the minority. Because of the fact that these schools must stand alone, it is almost impossible for them to stand on the highest professional basis.

With regard to the examining boards, they are a necessity, but if we are ever able to attain to the high ideal given us by the essayist, I do not believe the examining board will be a necessity.

Dr. Guilford spoke of Canada and the interchange of licenses there. I believe that is in direct line with Dr. Butler's ideal, and if we are able to work out that idea in this country it will not be necessary for us to spend so much time in attempting to obtain reciprocity between the states. If we had our education concentrated in the universities, they could readily agree upon a plan by which some such board as that spoken of by Dr. Guilford could come into existence, and then all would be able to practice in any community whatsoever.

Dr. W. R. CLACK, Clear Lake, Iowa. Dr. Butler has said some very disagreeable truths in a very pleasant manner. Not all of us are able to say these things in the nice way he has said them. Even Dr. Guilford has subjected himself to criticism when he gave the illustration he did. I do not believe that he really intended to put the dental profession of this nation on a par with the keeper of the small stores. My father was a minis-

ter, and he used to say that when God called a man to preach, He at the same time called a congregation to hear him. I believe when the Lord calls a school into existence, He is also going to call students to support that school, but a great many of these schools have not been called by the Lord, they have been called by men, and by men who have only a commercial interest in view. I know whereof I am talking, in one particular instance at least. A university in the northern part of Iowa thought they should have a dental department in order to give the university the proper standing before the world. To that end they called a meeting of the medical men of the profession in that district, and while I am not a physician, I was invited to attend the meeting, and at that meeting I heard things unwittingly laid on the shoulders of the dental profession that made my face burn with righteous indignation. They said the university needed money to succeed, and they believed the greatest money-maker they could get would be a dental department. They said, "The dental clinic always is a money-maker, and we can make that money carry along the other departments of the university." There was a man present who had been tendered the deanship of that proposed dental department, and he rose and said, "Gentlemen, a mistaken idea of the ethics of dentistry obtains among you here tonight. I was asked here under the supposition that you wished to organize a dental school upon a high plane, and my only answer to you is this: that if you wish to organize a dental school which shall be better and higher than any dental school in Iowa, I am with you heart and soul; but if you wish to merely organize another dental school, I am not with you."

I believe that course taken by the profession at large would eliminate many of these schools that have been called by man. There are so many of these smaller schools, that they are tempted by lack of funds to take any man who applies for matriculation. The profession of any state can have a dental school that is entirely above financial considerations,

if we will all put our shoulders to the wheel and work—a school the possession of a diploma from which will be "letters patent" on its face that the man has not merely *completed the course of study*, but that he is *qualified to practice dentistry*. And in order to do this these institutions will have to have men able and competent to *show* these students what they are trying to teach them. The practice of dentistry is very hard indeed to learn from text-books. The schools must have men that can show the students what they mean, and they must have men of the highest order, so that these students may be shown the highest ideals of dentistry.

Dr. Butler's ideas were spoken of by Dr. Conzett as being visionary. Gentlemen, you must have visions. It is not within the power of every man to see these things clearly, and we must set our target high or we will never shoot high.

Dr. TRUMAN W. BROPHY, Chicago, Ill. I have listened with a great deal of interest and pleasure to the paper presented by Dr. Butler, and in it I find very much material for careful consideration by men engaged in dental educational work. Certain passages in the paper I think were somewhat theoretical, and cannot be well put into practice, especially under the present conditions. What Dr. Butler needs to master in the carrying out of his views on this subject is that which some men have been pleased to call commercialism. I have found that men who discuss the subject of dental education and make reference to commercialism—if I understand what the word means—are men who have never been in the harness and learned what it is to struggle for the procuring of funds to equip an institution, to supply the necessary materials for carrying on the work and for the paying of demonstrators and teachers who must give up their time for teaching. Commercialism so looked upon and discussed should not be brought into consideration in this connection. What Dr. Butler requires would be millions of money, with which to endow these institutions so that they would never feel the need of funds for carrying on their college work as it should be done. And tell

me, gentlemen, if you can, where there is a dental institution in this world that has an endowment of a dollar? Name a state in this Union which appropriates a fund for the carrying on of dental work? And failing, as you must, to answer my question in the affirmative, and realizing that you must have money for the carrying on of dental education, then you must consider the source from which this money comes. There is only one source, and that is the fees paid by the students for their education. Can anyone name an institution that has an endowment or receives an appropriation from the state?

A MEMBER. The University of Pennsylvania Dental Department.

Dr. BROPHY. The University of Pennsylvania Dental Department has not a dollar of endowment. I am willing to submit this question to the trustees of the university for an answer, and that board will say that there is not a dollar of endowment for the dental school. This information was given to me direct from Dr. Kirk, the dean, and there are many here who can verify my statement. Two years ago—before preparing a paper on the subject—I wrote to the dean of every dental college in the United States, and asked this question, "Have you an endowment for carrying on college work?" And the question was invariably answered, "No." If there is anyone here who will rise and say that there are schools that have endowments, then I stand corrected.

Dr. GOLDSMITH. Is an endowment only possible in dollars and cents? Is not land considered as an endowment?

Dr. BROPHY. Do you mean to say that the Dental Department of the University has land?

Dr. GOLDSMITH. I mean to say that the state of Pennsylvania has given large tracts of land to the university, and that in return the latter has scholarships which it allows to high-school graduates of the city of Philadelphia; and I happen to be one of them.

Dr. BROPHY. Do you mean to say that the University of Pennsylvania is a department of the state?

Dr. GOLDSMITH. I mean to say that it has the indorsement of the state.

Dr. GUILFORD. You mean the city of Philadelphia.

Dr. BROPHY. The young man is misinformed, and I will try and set him right. I want to say that the University of Pennsylvania is not a department of the state—it is not a state institution. I will go farther, and state that it is not a state university, and I challenge anyone to refute the statement.

Dr. C. M. WORK, Ottumwa, Iowa. The University of Iowa is one of those institutions which Dr. Brophy says does not exist. It is governed by a board of regents appointed by the governor, being recommended for appointment by election from each of the eleven congressional districts. The fees which that university receives from clinics and from students is turned into the state treasury.

Dr. BROPHY. There are four state universities that have dental departments—Iowa, Michigan, Minnesota, and California.

With regard to the question of a national board or a commission, I believe that such a board or commission is desirable in this country. The only drawback is that it would interfere with the legislation of the different states. We are like a number of different governments rather than like one government. A gentleman in another country asks what the qualifications for practice are in this country; and what are you going to say? We know that when a man qualifies in one state, and goes into another and attempts to practice, he is likely to be arrested as a violator of the law of that state; and yet if he has a qualification entitling him to practice in one state he should be allowed to practice in any state. He cannot do it, however, as the laws of the different states forbid. If my friend Dr. Butler will put himself to work on this question, and get that settled, so that we will be like one nation instead of many; so that a man who qualifies to practice in New York may go to Michigan or Pennsylvania or any other state and practice, then he will have accomplished a great work. As it is, we

are the topic of adverse criticism throughout the world, because of the fact that we have no national qualification. I would like to see this rectified, and I will join in a movement for creating a national commission, made up of men who have ability and standing in the profession, before whom a man may go for qualifications that will stand anywhere and be a guarantee of his ability. I feel that this subject, discussed as it has been and presented in such a manner as the essayist has presented it, will result in great good. While none of us may live long enough to see the provisions of the paper carried out, we may live to see steps in advance that will result in benefit to the profession in general.

Before I sit down, I want to say that the dental institutions of this country stand today on an equality with any of the professional schools that we have. I am proud of the fact, Mr. President, that the dental colleges of the United States in the last twenty-two years have created a condition of things far beyond that which the most earnest workers in dental education deemed possible. We have advanced the standard of dental education to where it is at the present time. We have extended the course of instruction from one course of four months to a course which now means something definite. And in this connection, I want to say that the standard of dental education as adopted by the National Association of Dental Faculties is better than any ever proposed before in the United States. We have a standard that means something. We have a standard in days and hours of time. We have a standard, not in an uncertain term of years which means nothing definite; we have a course of instruction extending over thirty weeks of six days each in each year, and continuing for three years, which gives as much as a four years' course of seven months, less about forty days. Some of the schools have adopted the thirty-two weeks' course, and if you will consider that, you will see that thirty-two weeks of six days each week, exclusive of holidays, means the same as the four years' course of seven months.

Now, when we consider that, we cannot say that the colleges of this country are encouraging a retrograde movement. If you had seen at our meeting the number of colleges desiring to advance the standard, you would have been convinced that we are working to hold the institutions together, to increase their usefulness, and lift the standard so that America will be in the future as it has always been in the past—among the first in the world in matters pertaining to the advancement of the dental profession.

Dr. C. W. RODGERS, Boston, Mass. I rise to discuss that portion of the essayist's paper with reference to the abolition of the state boards.

I desire to state that I come from a section of this country where the condition that the essayist wishes for actually exists. I have reference to university connections. In the New England States we have but two dental schools, and they are both connected with universities. I believe that this fact in itself has not helped to place dentistry in New England on a higher plane than have the various non-university schools of Philadelphia. Also this university connection has not carried with it any call for the elimination of the state boards.

The essayist seems to think that if we could have this national commission appointed we would not require the state boards. Now, the fact is that the state boards have been of the greatest aid to the two schools in New England. They have constantly kept them aiming higher. Another fact: If you go before the state legislatures and ask for the elimination of the state examining boards, and ask their approval of a national commission such as the essayist desires, you will run across a hard proposition. You would aim at destructive legislation and interference with states' rights, of the maintenance of which the state legislatures are individually very jealous.

The proposed legislation would be destructive, because its intent is contrary to the genius of our institutions, and if enacted would tend to aid in undermining our whole democratic system of government. Why, gentlemen, it is

possible at the present time for a boy to ascend to the presidency of the United States without having seen the inside of a primary school, and you would ask legal aid to have conditions such that the boy with the ability to rise to the presidency could not rise to the practice of dentistry unless he be a graduate of a dental school. Our New England legislatures, when they gave authority to the state boards to examine applicants, did not say to them that they should examine graduates only, and it is none of the business of the board where a man gets his education, so long as he has it. That is the point we should not forget. The same idea is carried out in the catalogs of the various dental schools. They require a high-school certificate or its equivalent, and the word "equivalent" stands for an important principle.

I consider that the suggestion of a national commission supervising the system of dental education is all wrong.

Dr. BUTLER (closing the discussion). In closing this discussion, there is very little to be said in addition to what has already been presented in the paper itself.

I am not at all surprised or disappointed that those who have discussed it have failed to grasp its conception, or to rise to the level of its thought. I scarcely expected them to do so, as it looks rather to the future than to the present, and is along lines which have not heretofore engaged the attention of the profession, and on which our educators have not been thinking. Hence it was hardly to be thought that a change so radical, no matter how commendable, would at once meet with favor.

We fail to realize, also, that all our advancement has been attained only after long, earnest, and sometimes contentious effort, and that it is always necessary for someone, even at the risk of unpopularity, to lead in any forward movement.

That reforms in our educational system are needed to meet the requirements of the profession all admit; that they are to come I am sure we all believe; but how and in what way is for the wisdom of the profession to determine. Just at pre-

sent the greatest obstacle in the way of reform is the fear among our college men that any change, however simple, which will disturb the present condition of things will be harmful, and therefore is to be avoided. These men seem not to appreciate that our whole educational development has been, and must continue to be, a matter of slow growth. But as I said in the paper, we *must* grow, and to this end there must be constant unremitting and intelligent effort; and while the wisest advancement may not be along the lines I have indicated, yet it must be along some lines that will lead to a deeper, broader, and more comprehensive system.

To me it means much that within the past six years England has organized, equipped, and put into active operation not less than five universities for general and special education. And not the least interesting thing about these colleges is the fact that they are organized along the lines of our American universities, and that the dominant department in each partakes of the character of the principal industry of the town in which it is situated. For instance: Birmingham—Metallurgy and mining. Liverpool—Tropical medicine, marine biology, fisheries, electrotechnics and physical chemistry. Manchester—Chemistry and physics as they relate to cotton industries, and with a department in dentistry. Leeds—Cloth-weaving with a department in textile dyeing, coloring, etc. Sheffield—Ironmongery, cutlery, and mining.

Of course all this has no bearing upon the question of dental education, except as showing the general tendency along special educational lines in the industrial world. But are we to expect less in the professional world? It seems to me, not. On the contrary, should not professional advancement and the special education attending it lead everything else?

There is just one thing, I am pleading for today, namely, a wider interest in the profession itself in behalf of dental education.

Our college men are interested now; but we need more than this. With the

whole profession actively and earnestly interested, there can be no question about the future. That the suggestions of the paper are entirely practicable, I have no doubt; that they are the best that could be adopted at this time, is for our wisest

men to determine; but in any case it is for this association to lead the profession out into wider and more adequate facilities for acquiring the education our specialty demands.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, October 1906.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 16, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city. The president, Dr. Van Woert, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the last regular meeting (that of April), which were approved.

The Secretary read the resignation of Dr. I. Franklin Wardwell. On motion of Dr. W. W. Walker, the same was received with regret.

Dr. WALKER. I know the members will all be sorry to learn that our friend, Dr. S. G. Perry, has been very ill. About ten days ago he was lying at the point of death, and had it not been for the efforts of his old physician, in consultation with three others, I doubt whether he would have pulled through the crisis. However, I received a telephone message today from Mrs. Perry, saying he was a little better and able to walk around. It would have been a very sad thing to have lost that dear, sweet man, who has been so kind and good to all of us, and I am sure you will be glad to know that he is getting better.

Dr. Dailey says we might send a telegram to him, saying we are sorry to hear of his illness, and glad that he is on the road to recovery. I would make a motion to that effect.

The motion was carried and the secretary was requested to send such a telegram.

Dr. WALKER. The other incident I would like to relate is that Dr. A. L. Northrop, our old friend and associate, has retired from practice. He ought to thank God that he can do so, and that he does not have to keep on looking after buccal cavities, nerve-canals, etc. He will spend the balance of his days in peace on his farm in Ridgefield. I would move that a committee of three be appointed to make arrangements for preparing an honorary membership certificate, and to have the same presented to him in due time.

The motion was carried, and the President appointed Dr. Walker, Dr. Dailey, and Dr. Sanger as such committee.

Dr. F. B. KEPPY. I would like to move that a committee of three from Brooklyn be appointed to draft suitable resolutions for making Dr. Jarvie an honorary member of this society. He has also retired from practice.

The motion was carried, and the President appointed Drs. Keppy, Schmidt, and Quinlan on such committee.

The paper of the evening, entitled "Operative Dentistry," was then read by Dr. NELSON T. SHIELDS, as follows:

OPERATIVE DENTISTRY.

From the above title it will be seen that I purpose to describe in a brief paper the surgical care and treatment of teeth from childhood to old age.

Surgery is precise, and we can accurately calculate the result of the oper-

ation, be it large or small. In all operations every effort should be made to preserve the structural features of the teeth.

Should deciduous teeth become affected by caries, our first thought should be the preservation of the dental pulp, remembering the size of deciduous pulps in proportion to the size of the teeth. These cavities should be prepared without mutilation, and filled with the material that is most compatible with tooth-structure, under no condition using the mallet. To save the deciduous pulp by most careful manipulation is not only the best treatment for the tooth, but it enables the root to be physiologically absorbed as its permanent successor approaches the erupting period.

At the time the deciduous teeth become a little tender under the stress of hard mastication, the largest permanent molars erupt—at about the sixth year. It behooves us particularly at this time to advise thorough prophylaxis, in order to enable the saliva to come in better contact with these teeth, thus neutralizing the acids and preventing decay; and the same care should be advised regarding deciduous teeth.

Should decay or disintegration commence on the anterior approximal surface of a first molar before the eruption of the second bicuspid has begun, we must remember that irritation has already commenced in the molar pulp by transmission through the dentinal fibrillæ, odontoblasts having formed a calcified layer within the pulp-chamber nearest the decayed spot. The reduction of irritation to the dental pulp should be our first consideration, and the prevention of further irritation through further decay the second. In the preservation of normal conditions I most strongly advise the removal of the decay only—but to the full extent of the affected enamel—extending the cavity only deep enough to allow for the introduction and stability of a perfect filling. Now we have a filling on the anterior approximal surface of a first molar before the patient is ten years old, with tooth-structure clear and healthy all around this filling.

Through the agency of the saliva, and through prophylaxis, we may never have caries appear on this surface again, but should decay appear five or six years afterward, the walls of the tooth will have become so much thicker and so much more dense by the natural recession of the pulp that we can at this time prepare the cavity, and if necessary extend it through the occlusal surface, removing all decay from the fissures and not allowing the filling to end in a fissure. But not even at this time should the cavity be extended by cutting solid tooth-structure, and unnecessarily irritating the dental pulp, which will contain calcified formations in the pulp-chamber beneath the grinding surface and along the anterior approximal wall.

After the eruption of the second molar, at about the twelfth year, the first molar may decay on the posterior approximal surface, and it may be necessary to extend the cavity to the occlusal surface, which should be done without too much cutting, especially in the direction of the cusps, where the irritation to the pulp would be greatest. This filling contoured to the anatomical form of the tooth, and the material thoroughly adapted to the walls will surely, under ordinarily healthy conditions, preserve this tooth until the patient's thirtieth year or longer. Should decay appear at this time, we know that every care had been exercised in the prevention of irritation to the pulp, and that the calcifications have formed at a point farthest away from the foramina or entrances leading from the pulp-chamber to the root-canals, and we can without fear of subsequent irritation extend the cavity beyond the contact point of the approximating tooth, and introduce the filling with the expectation of a permanent result. In the preparation of this cavity for permanent filling it will not be necessary to excavate below the cervical margin, neither will it be necessary to cut a great flat slot in the grinding surface for strengthening the filling, as a very much smaller occlusal excavation, with a slight stay or undercut in the direction of each cusp, will be just as strong and will

obviate the necessity of mutilating the tooth.

For permanent work it is not necessary to bevel the buccal, lingual, and palatal walls, as a straight wall free from approximal contact is more artistic in appearance. Such a technique results in a stronger tooth and in less irritation being inflicted on the pulp, but the enamel being thickest at the grinding surface can be beveled beyond the contact point and contoured at this time with perfect safety. The enamel could have been beveled in the previous operation, if additional anchorage in the dentin were not required.

Unfortunately, patients come to us in all conditions, and the selection of our filling material should be made with the view of saving first the pulp, and then the tooth. Combination fillings and combination of mallets should be used when it is best. In cases of nearly exposed pulps, the cavity can be lined with cement, and a crystal gold embedded or pressed into the cement, to be subsequently used as anchorage and finished with foil, first using the automatic mallet, and finishing with the electric mallet. Shallow cavities may be filled in the same way, but where strength is required the foil form of gold should always be used.

It is a mistake to have a stereotyped form of cavity in mind, and to form all cavities posterior to the canines after that model, regardless of conditions. I have in mind a case of very irregular teeth where the approximating surfaces are in close contact, practically throughout the entire surface. This patient, a Mrs. S., is thirty-seven years of age, and the cavities in her teeth were filled when she was about fifteen years of age. Although the cavities were very small and the tooth-structure touched the approximal surface of the approximating tooth all around the filling, there is today no sign of further decay. The same statement can be made regarding her upper incisors. These cavities were filled with non-cohesive gold, cohesive gold being wedged or malleted into two folds of the non-cohesive gold, and although the teeth are very irregular, their natural artistic appearance has been preserved.

Non-cohesive gold has a most important place in commencing a filling at the cervical portion of large cavities, and in producing perfect contact in all cavities with good walls. In difficult posterior cavities in third molars involving the whole cervical and posterior lingual or posterior buccal cusps and grinding surface, a gold inlay can be used to great advantage, but the general use of either the gold inlay—and more especially of the porcelain inlay—should be avoided. Crystal gold should never be allowed to come in contact with dentin, on account of its extreme incompatibility.

Ascher's enamel has so far given great satisfaction in restoring suitable cavities in canines and incisors. Last, but not least, we occasionally find amalgam in combination with cement advisable in bad posterior cavities where the expense of the operation is taken into consideration.

In the preceding remarks the maintenance of the normal condition of the pulp has been discussed but now we shall consider the subject from a different aspect.

Had the anterior approximal cavity of the first molar been filled before the eruption of the second bicuspid had occurred, by an operator advocating the "extension for prevention" principle, the whole anterior approximal surface would have been removed below the cervical margin, and in all likelihood he would have extended over most of the grinding surface, with a large slot cut into the grinding surface for strength; and without question the operation would be very much more permanent. It must be remembered, however, that the cervical margin at that time was not the cervical margin of ten or even five years later, and large calcified bodies would rapidly form at a point very much nearer the foramina of the anterior root-canals, and from this irritation pulp-stones would be liable to form throughout the entire pulp, causing congestion of that organ at the age of twenty-five or thirty—or at any period before—and necessitating the extirpation of the pulp. The same result would be likely to follow had the cavity

been filled at the age of twelve or fifteen years.

Cervico-labial and cervico-buccal cavities in the anterior teeth, whether caused by caries or acid erosion, may be filled with either porcelain or Ascher's enamel with good results. These cavities are very irritating to the pulps of all teeth, for the reason that the blood has to circulate around the calcification, and congestion is more liable to follow a few years later. I will state here that I have seen many cases of uric acid diathesis where the crowns of the teeth had been reduced one-third of their original diameter from the labial and buccal surfaces without the roots being exposed, the teeth remaining absolutely tight, for the reason that the calcified formations were confined to the crowns.

Even with the best of care we are liable to have congestion in the dental pulp, and when it is recognized, through such symptoms as sore teeth, pain in the arms, nervousness, headache, pain in taking anything hot or cold, recession of the gum, ulceration, etc., then carefully ascertain the affected tooth or teeth, open into the pulp without causing pain, employing sharp burs and correct manipulation, and extirpate under cocain this wonderful tooth-builder, which has now become a tooth-destroyer.

The fact that the vital nature of the teeth demands careful steps to avoid and to allay all irritation is offered as my reason for this positive stand against the indiscriminate application of the principle of "extension for prevention."

Discussion.

Dr. JOHN A. SCHMIDT. I had the pleasure of reading a copy of Dr. Shields' paper. It is opportune in this age of extension for prevention. The paper is an excellent one, and shows the essayist to be not only conservative, but humane. It is well to consider the points he has raised, and to follow the sequence of irritation to the dentinal fibrillæ, viz, secondary dentin, pulp-nodules, neuroses, and death of the pulp, with its sequelæ.

Regarding the care and treatment of

the teeth of young children, it is exceedingly difficult to have them carry out the instructions regarding prophylaxis. This I have found to be the case with my own children, and though time and care have been given to their teeth in this matter, the results are not much better than with my other little patients. As Dr. Shields has said, to cause the roots of the deciduous teeth to be physiologically absorbed we must preserve the life of their pulps.

What does he consider a compatible filling material in deep-seated cavities of the deciduous teeth? Take for example two compound cavities extending to the gingiva in the approximal surfaces of the first and second molars.

The pulp of the first molar, at the age mentioned by the speaker, is highly vascular. Avoidance of irritation of the fibrillæ, and also of strain on the nervous system of the little patient—the latter a very important factor—must be taken into consideration. Would Dr. Shields fill such a cavity with gold? I believe—for the reason that prophylaxis is not carried out as fully as is desirable—that these cases usually require another filling in four or five years.

I cannot agree with the essayist in placing a gold inlay in a third molar, the cavity involving the whole cervical, postero-lingual, or postero-buccal and grinding surfaces. This I deem an unfavorable place for an inlay of any material, and it is the selection of such cases that gives a black-eye to inlay work.

I have had a large experience with inlay work, and my failures have been where I have attempted it in cavities where I would not attempt to use gold. Inlay work is all right, used in proper places and under proper conditions; my own failures have been in just such instances of poor judgment. The use of the rubber dam is as necessary for success in this work as in gold work.

That third molar can best be saved by the use of a combination cement and amalgam filling, working the amalgam into the soft cement, and giving special care to the edges. The cement affords adhesion, avoids the use of deep undercuts, and lessens the susceptibility to

thermal changes; but be sure to place a thin gutta-percha layer over the deep-seated portion, as the oxyphosphate is liable to be irritating, although the oxyphosphates of today are far superior to those we formerly were compelled to use, and are claimed to be free from the slightest trace of arsenic. I put in many of these fillings, not to avoid expense, but because I know that it is the material best adapted to the case.

Why is crystal gold more incompatible with dentin than are other forms of gold? Is it not entirely free from the acids used in the process of electrolysis?

The method followed by many of our best operators, of using a creamy oxyphosphate and working into it the moss fiber gold, finishing with gold foil, has a tendency to eliminate to a large degree the irritation produced by extension for prevention, deep undercuts, and thermal changes.

Regarding Ascher's cement, I would like to hear from others as to its value. I have used it but a few months. It is easy to insert, of low conductivity, and can be mixed to match almost any tooth; however, I have used it sparingly, thinking that possibly it may be an improved Archite cement.

Another cause of secondary deposits and their sequelæ is the proper preparation of a living tooth for a gold or a porcelain jacket crown. This is possible even when the crown is set with gutta-percha; as for example in the case of bell-shaped crowns. We frequently cut close to a horn of the pulp. Regarding the life of pulps after the beginning of secondary deposits, I will quote Dr. Black: "Life may extend from a year or two to half a lifetime or more, but a very large proportion of these pulps are lost within ten years. Some of these cases will result in abscess, but very many pass on for years in a state of perfect tranquillity, giving no indication of death of the organ."

Dr. M. L. RHEIN. It is rather a difficult paper to discuss, as the title covers almost everything. We all know the results and quality of Dr. Shields' work. There is a vast difference between theory and practice in operative dentistry. For

my part, it is an impossibility to lay down to any student or practitioner a method of preparing or filling any theoretical line of cavities, because in my own limited experience I have never seen two cases that called for the insertion of exactly the same kind of filling. I say that with about as much emphasis as anything I could on this subject, and if it be true, it is the strongest argument that can be brought against the acceptance of the main portion of what the essayist has said tonight. Dr. Shields has not presented this matter to us for the sake of being complimented on what he has done, but no doubt desires to have what he has said criticized; and what little I have to say will tend in that direction.

There would be a great many more works on operative dentistry before the profession if it were not that we must study each individual cavity that presents itself, in order to decide what is best for each case, taking into consideration not only the condition of the mouth, but the age and temperament of the patient, and every small contiguous circumstance that relates to the operation.

Of course we do have a general variety of cases that resemble each other to some degree, and in regard to those cases the essayist has promulgated a form of pathology this evening that is astonishingly new to me. The study of diseases of the pulp—and, when I say that, I mean any variation of the pulp from its physiological and normal character—is in its infancy. It is one mystery that dentistry has not solved up to the present, and it is to my mind a most interesting subject for scientific investigation. In a few words, the essayist claims to have solved this question: I doubt it very seriously. He said dogmatically that pulp-calcification starts in certain positions in the pulp when certain things are done, and that it does not start in this position when other things are done. My experience is at variance with that. I might say without boasting that I have given a great many years of careful study, although not as much as I would have liked in this busy bread-and-butter existence

we must lead, to classifying the different forms of divergence of the pulp from the normal.

Dr. Vida A. Latham of Chicago, who I believe has given more attention to this subject than all the rest of the dental scientists of the world, has told me how little—notwithstanding the amount of time she has spent at such work—she has really accomplished, and what a vast amount of work there is still to be done. It is idle for anyone to set up a dogmatic statement, based purely on clinical deductions, as to the pathological conditions of an organ in which the variations are so microscopic as is the case in the pulp. In those first and second molars which the essayist has mentioned, where attempts had been made to just help the teeth along, inserting fillings that would save them for a certain time, without attempting to put in what may be termed permanent fillings—whether they were cement fillings, or amalgam, or gold—the sum of my observations is that following such procedure I have found the most pulp-disease and the greatest amount of calcic formation that ended in pulp-destruction; and *vice versa*, in those cases where it was feasible to fill those teeth permanently with gold I have found the least amount of subsequent pulp-inflammation.

Here we are—two operators giving our own entirely different dogmatic opinions and observations. I have no doubt that Dr. Shields' observations are fully as honest as my own, and I do not say this to set up my own observations as having any great amount of value, but to support the assertion that this is a subject on which we are unable to speak with any degree of authority. I refer to the question of the etiology of diseases of the pulp. Let us stop for a moment, and think what happens when caries attacks a tooth. As soon as the smallest amount of that tooth-substance is involved, irritation has started, and we know that inflammation must result; and we also know from microscopical examinations of thousands of pulps that no such tooth will contain a healthy pulp. That we *can* say dogmatically, because in

the thousands of teeth in which the pulps have been examined, that one matter has been settled; but to what does the disease of the pulp lead, and how can such a pulp be retained, even if it be at variance with the normal type, so that it should not be lost and so that extensive calcic interference should not take place? These are mysteries to us at the present time.

There is no doubt that exaggerated extension of cavities in young people with certain temperaments and in certain conditions of health is not only uncalled for, but would be brutal if attempted. On the other hand, where caries presents itself in the mesio-approximal surface of a first molar before the second bicuspid has erupted, and the patient is a sturdy child with a temperament such as many children have, looking upon operative dentistry as a pastime if it be properly presented to them—and I have seen hundreds of such children—the extension of such cavities on the plan outlined by Professor Black—and followed for so many years by Dr. Marshall H. Webb and some of the operators who antedated him—if properly completed should result in the introduction of a filling that will save such a tooth permanently, with less discomfort to the future of the patient than any of the means advocated by the essayist. No one here will attempt to deny that the contouring of the approximal surface is an easy matter at this time. It can be done in less time and with more ease than later in life, when the bicuspid is in position. This is one of the strong arguments for a permanent operation at such an age. The argument as to its greater detrimental effect upon the pulp I positively deny, because the essayist has absolutely nothing but his own experience to substantiate such an argument, and it is entirely contrary to the experience of many good operators.

In reference to the other point made, as to further extension of pulp-disease, so that ultimately the pulp is lost, which will and does often happen, I might as well tell you my theory; it is a simple one. If the child grows to manhood or womanhood strong and robust, there will

be no trouble with the pulp; but if beset with ills and woes—has grippe, pneumonia, or scarlet fever, and all that sort of trouble, the diseased pulp will be more diseased and in a worse condition. It is the weak point in such a patient's mouth, and will be the seat of trouble that would not affect it if the child went on to maturity as a robust, healthy person. If such a pulp becomes diseased to such an extent as to necessitate it, its removal is more easily and more correctly done through the occlusal portion of the tooth, without disturbing the original contour of the approximal restoration. It is then possible to thoroughly and aseptically cleanse and fill such root-canals, thus placing the tooth in a condition where it will not give trouble later in life. It is certainly easier than this constant re-filling of teeth.

As far as I can make out, the main tendency of the paper was a plea against what I have just advocated—a plea against the permanent filling of such teeth at a youthful age. In what I have said I want it distinctly understood that there are many cases where the essayist is right; but his method is excusable only when the temperament of the patient and the surrounding conditions are abnormal. Where those conditions do not exist, I do not consider that it is good dentistry as regarded in its present advanced stage.

One last point I will touch on is where the essayist speaks of starting a filling with soft gold, using foil first with the automatic mallet and then finishing with the electric mallet. When he said he would finish with the electro-magnetic mallet, I supposed it was because he believes he would get in these posterior teeth a stronger and better filling; but I cannot understand why he should want to use an instrument such as the automatic mallet at the outset, when the electric mallet, used as soon as a mallet should be used, would not only do the work more rapidly, but condense the gold more thoroughly. He may have some reason for doing so, but to my mind the blow of the automatic mallet in the interior of the tooth is about as bad a thing

as I know for causing shock to a patient. The greatest advantage of the electro-magnetic mallet is that with the enormous rapidity of its blows—from 3300 to 3500 a minute—shock is reduced to a minimum, and condensation of the gold carried to a maximum degree.

Dr. OTTOLENGUI. I believe that if we had many papers like the one of tonight, we would suddenly hear of a new school in operative dentistry, with a system of its own, and Dr. Shields would belong to the old school, because the gist of his paper, as I get it, is an antagonism of the new system. It is true, as Dr. Rhein said, that every cavity is a law unto itself; but all cavities are amenable to a definite system of work. Teeth can be filled, as was said long before I was born, not only with method but with judgment, and one must use judgment whether one has a system or not. It is a mistake to oppose a system of filling teeth merely because a few extremists have possibly carried it too far. It would have been much better to have upheld the system, eliminated its faults, and brought out the good that is in it.

In one of the western societies last year, ten men from the West gave a very interesting clinic. They placed their chairs in a row, and started to operate on their patients simultaneously. Each prepared a cavity. As soon as his cavity was prepared, he laid aside his instruments, and empty-handed, walked one chair up—a sort of progressive filling party. He then operated on the next patient, and without altering the shape of the cavity, filled it. Having done this, he left that chair and walked to the next, and finished and polished the work which his predecessors had done; and when the work was all finished, the ten were pronounced perfect fillings.

Now, gentlemen, you cannot object to a system which enables men to fill teeth in that way. I enter my protest against that portion of the paper in which it is said that we cannot have a definite method of filling teeth. It used to be said that we could not have a definite method of filling root-canals, but we have.

I want to say a word about children's

teeth being filled with gold. It seems to me that it is much better to fill a tooth once than ten times. There is no more danger—or very little more—in filling a deep cavity in the young tooth than in filling a cavity the same distance from the pulp later. The depth of the cavity should be measured from the bottom to the pulp, and whatever one would do to protect the pulp which is nearly approached in a young tooth, is just as essential to carry out in an adult tooth. The pathology is just the same, and the danger of mistakes is just as great. There is no reason why a young tooth should not be as finally filled as a tooth in an adult mouth. The only point is, that it is generally considered that young people will not submit to the operation as the older ones will, but that is a matter of personal equation—a matter of the ability of the operator to manage his patients. In many practices men can manage adults better; I have rather made a specialty of children, and long ago, when people asked me how I succeeded with the young, I would say, "I treat children like grown people." The children end of my practice I find is growing. And when it comes to saying how I manage adults, I must say that I treat grown people as I do children—and that is the sum and substance of the whole thing. Teeth are teeth, and each cavity must be considered in connection with the temperament of the child and the possibility of making a perfect filling, regardless of the youth or age of the patient. If a perfect filling can be put in the tooth, put it in when the patient first comes to you. Take one fee for it instead of many, and you will earn not only your money, but the gratitude of the patient.

I never have tinkered with teeth in my practice of a quarter of a century, and I have not found those dead pulps with which you are all threatened. I do believe that we look too closely to the tooth, forgetting that it is part of the body and subject to the same diseases; and very often, when pulpitis ensues and a dead pulp is found, a man is blamed for having inserted a gold filling too close to the pulp, when the pulp really died from

constitutional causes, from infection, or from some other source than the proximity of the filling.

Dr. JOHN I. HART. There seems to have been a misconception of what the essayist said. If Dr. Rhein understood the essayist correctly, then I must have misunderstood him, and I am going to state the proposition as it seemed to me. My understanding of what the essayist said about the filling of the mesial surface of a first molar was that he would place in that cavity, after having prepared it, a perfect gold filling; but he would not extend it "for prevention."

Dr. Rhein stated that it was his understanding that the essayist might put in that cavity amalgam or one of the oxyphosphates, and that he (Dr. Rhein) would extend the cavity according to the Black theory. If the essayist's remarks were as Dr. Rhein quoted them, then my leaning would be toward Dr. Rhein's practice; but if my understanding of the essayist is correct, then my leaning in practice and teaching would be toward the theory advanced by our essayist. In spite of what the last speaker has said, that pulp-irritation may be started even though we do not approach the pulp closely, I think he will concede that for the proper anchorage of a filling, where the cavity has been extended for prevention, we must approach the pulp more closely than we would for the simpler form of filling, and that the pulp is much larger in a first molar, at say eleven years, than we would expect to find it at twenty-five years; consequently I do not think we are justified in extending the particular cavities we are speaking of so as to include the whole mesial surface and a portion of the morsal surface.

Dr. SHIELDS. I heartily thank you for the earnestness of this discussion, and I am very glad that the subject interested you to such an extent.

I consider, Dr. Schmidt, that gutta-percha is a very compatible filling for deciduous teeth wherever we can use it. In an anterior approximal cavity in a first molar before the eruption of the second bicuspid, I certainly should use gold, filling the greater portion of the

cavity with non-cohesive gold in folds, and wedging the cohesive gold into the latter, making an absolutely tight filling that can be contoured correctly and which when finished will cause nothing but beautiful yellow reflections that will never turn dark.

In regard to crystal gold, the reason it is so very incompatible is simply because the gold is formed of crystals matted together, and when made cohesive these sharp crystals actually penetrate into the dentinal fibers, and are extremely irritating. I have been fortunate enough to remove many, and have found this to be the case. Whenever the necessity arises for using the crystal gold, it is easy to just touch the bottom of the cavity with a little cement, thus making it impossible for the crystal gold to come in contact with the tissues.

Dr. Black has been quoted, and I am only too glad to use Dr. Black's quotation in my own answer. I learned a great deal from his lantern slides, and they verify my own clinical experience. I also learned a great deal from Dr. Kirk's slides, and will tell you how I have applied the information thus gained. Take teeth without any cavities at all—the lower incisors are the ones to which I have particular reference. After the age of twenty-five, at any time when the little line of dentin becomes exposed the patient has not the slightest cognizance of any irritation. From Dr. Kirk's and from Dr. Black's slides you will see right over the pulp that calcified mass. You can verify other statements made in this paper from the able demonstrations of Dr. Kirk and Dr. Black.

Dr. OTTOLENGUI. I think if I remember that paper of Dr. Black's, that he made the following statement: he showed pictures on the screen of what you call calcified masses, but said that they were shadows; that they did not appear in the specimens, but only in the photographs, so I am not sure that they are calcified masses. Dr. Black has not decided what they are.

Dr. SHIELDS. They are inflamed dentinal fibrillæ—this is confirmed by similar slides exhibited by Dr. Kirk. In nei-

ther of those papers did I have an opportunity to discuss the subject, or I would have brought up the matter then.

It has been stated in the discussion why it is best not to put permanent fillings in young teeth where the pulps are so large and irritation is extremely dangerous. Take the case of a patient of forty-five years, where there is a small approximal cavity, with scarcely any decay about the tooth; also a small cavity in the fissure of the tooth. I had such a case last week, and I filled it, because there was a space where the first molar had been extracted. So small was the space that I contoured it to prevent the molar from coming forward and injuring the articulation. That was an operation where it would have been advisable to cut deeply into the posterior approximal surface, because the contour would have been more graceful. It was much more abrupt to end it where I did than to make that extension. This man was forty-five years old, and there was no caries whatever in that tooth. The tooth was extremely sensitive just beneath the enamel, and rather than extend the cavity, the liability of congestion of a pulp being so great, I made this abrupt extension—not square, of course, but not so beautiful as one built from the cervical margin—so sure was I as to the irritation caused by cutting.

The pulps found in a state of congestion are usually under large gold and amalgam fillings, more particularly beneath large amalgam fillings.

Dr. RHEIN. I understood you to say that you agreed with what I had to say. Under the circumstances, I want to know about this condition of congestion you repeatedly speak of—allaying this congestion. Will you tell us how you do it?

Dr. SHIELDS. I spoke of allaying it when the cavity was first formed. I stated that at the first presence of decay calcified masses have begun to form, and irritation of the pulp has started nearest the spot of irritation. The way to allay it is to excavate all the decay, including all affected enamel, and to insert a non-cohesive filling with a cohesive filling anchored into it.

Dr. RHEIN. How do you know it allays it?

Dr. SHIELDS. From the compatibility of non-cohesive gold.

Dr. RHEIN. You admit that the pulp is diseased after you have capped it. Do I understand that by the placing in of the non-cohesive gold you cure that disease?

Dr. SHIELDS. By cutting the smallest part, instead of mutilating it, you do the best thing for it.

Dr. RHEIN. Do you claim that you bring it into normal condition?

Dr. SHIELDS. No, but in the best condition that is within human power to attain; by having the cavity as small as possible the irritation is bound to be less than otherwise.

Dr. RHEIN. There are numerous cavities from which the patient does not feel any irritation. How do you know that this irritation is allayed? The fact that the filling has become comfortable is no proof. How do you find out that that disease of the pulp has disappeared? I would like the essayist to answer this question upon a practical basis.

Dr. SHIELDS. When a tooth is formed, it certainly is perfect, the enamel cells being first secreted, and the tooth forming from without inward. The less the disturbance to the mechanism from which that tooth was originally made, the better for the tooth. That is the point of the paper.

Dr. RHEIN. You did not examine the pulp microscopically?

Dr. SHIELDS. No; but a small filling will preserve the pulp infinitely better than a large one.

Dr. OTTOLENGUI. The last speaker has just made a statement, which if true I would like to know about. I thought at first that he would not fill those anterior approximal cavities in the first molars with a metallic filling. He now says that he would fill them with a compatible filling of non-cohesive gold covered over with cohesive gold. I am not sure what he means by compatible, and I want to know why a filling which first has some non-cohesive gold and then cohesive gold over it, is more compatible to the tooth than one made altogether of cohesive gold, because I understand the incompatibility of gold is in its high conductivity. Is non-cohesive gold any less conductive than cohesive? Will it conduct heat less rapidly?

Dr. SHIELDS. Yes.

Dr. OTTOLENGUI. You could not prove it in a thousand years.

The Secretary moved a vote of thanks to the essayist for his interesting paper, which was carried.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-eighth Annual Meeting.

(Continued from vol. xlviii, page 1245.)

CLINICS.

Dr. S. T. CLAY, Philadelphia. "A New Appliance for Spreading the Upper Arch."

Dr. Clay used for this purpose a piece of thin saw-steel, which was fitted to the

cast by filing and bending, after which the steel was tempered to give it the required degree of spring force for spreading the arches. Holes were made in the steel plate into which to engage a clamp forceps when placing the appliance in position.

Dr. CHARLES H. JACO, Philadelphia.
"Gold Fillings."

Dr. Jaco demonstrated the making of several gold fillings, in which soft foil was used for beginning the fillings and cohesive gold for completing them. The clinician laid special stress on preparation of the cavities and on the principle of packing the gold. He also emphasized the advantage of using a soft copper matrix (annealed), in filling all disto-occlusal cavities in bicuspid and molars.

Dr. D. O. M. LECRON, St. Louis, Mo.
"Porcelain Inlays."

Dr. LeCron had an interesting display of cavity preparation for inlay work, which was presented in his characteristic and painstaking manner. Enlarged models illustrating the preparation of difficult cavities with inlays fitted to them were shown, plaster being used to simulate the porcelain and brass the gold. An ingenious arrangement of steps and grooves was used to demonstrate the direction of the forces developed during mastication and the great amount of mechanical retention secured by the clinician's method of cavity preparation.

Dr. C. S. VAN HORN, Bloomsburg.
"Cavity Preparation for Porcelain Inlays, Illustrating Principles Conducive to Retention and Adaptation."

Plaster models were exhibited, in which cavities had been prepared to illustrate the principles employed by the clinician. In cervical cavities the floor was flat or convex, the cervical wall at right angles to the floor, and the wall toward the incisal edge of the tooth was beveled at an angle but slightly greater than a right angle.

Cavities subject to occlusal force had broad flat gingival seats, into which a groove was cut, the labial wall being formed at right angles to the flat axial floor. Inclined planes were so placed that adaption was facilitated, the inlay going to place in the direction in which occlusal force was applied, the greater the force the closer being the adaptation of the inlay to the cavity walls and margin.

It was a noticeable feature that in each instance tooth-structure was depended upon to resist, either directly or indirectly, the occlusal force, cement being used only as a necessary adjunct.

Dr. C. C. VOELKLER, Brooklyn, N. Y.
"A Method of Making Hollow Gold Inlays."

After the cavity has been properly prepared, an impression of it is taken in Perfection modeling compound. From this a die is made either with amalgam, or preferably Whites' inlay metal, the latter being poured directly into the compound impression. The die is invested in "dental lac" in one of the steel cups of the Brewster swaging press. To form the "inner piece," a piece of No. 36 gage pure gold, cut down to within a millimeter of the cavity margins, is swaged over this die. It is now placed in the cavity, a stiff mix of quick-setting cement is made and placed over it, and the patient is told to close the mouth in order to obtain a correct occlusion. A piece of softened compound may also be used for this purpose in small inlays.

The inner piece, with "contour form" of cement or compound in place, is removed from the cavity, and the latter is carved to shape, with proper contour, sulci, etc., but in the restoration of the anatomical form of the tooth allowance should be made for a thickness of gold. No. 34 gage, of which material the "outer piece" will be prepared.

The inner piece and contour form are now replaced on the die, and a piece of pure gold No. 34 gage is swaged over them. This forms the outer piece, which is cut down to within a millimeter of the inner piece.

The three pieces, namely, the inner piece, the contour form, and the outer piece, are now placed in their relative positions in the cavity in the mouth and thoroughly burnished.

The outer piece and contour form are removed, the inner piece is replaced on the die, and a large piece is cut out from its center, thus making a hole through which the solder may be introduced when the two parts of the inlay are in position.

The inner piece is then annealed, placed in the cavity in the tooth, and thoroughly burnished. The piece is now ready for soldering and finishing. Place the inner piece in position on the outer piece, grasp it with fine pliers, put a tiny piece of 22-k. solder, slightly fluxed, in one corner where the two edges of the metal meet, and hold in a Bunsen flame until the solder runs. Repeat this until the two pieces are joined all around with 22-k. solder. Then fill in the hollow with 18- or 20-k. solder to any desired thickness, and finish the inlay roughly on the die. The inlay is then set with cement and finished as a gold filling, care being taken to run the finishing burs, disks, etc., from the gold toward the enamel margins in order to get perfect edges.

The advantages of this method may be briefly summed up as follows: Simplicity; no investing; economy of time—large fillings which would require from ten to fifteen sheets of No. 4 foil may be made, set, and finished in from an hour to an hour and a half; economy of nervous strain on patient and operator, most of the work being done out of the mouth, with no malleting, and a degree of beauty and finish not obtainable in either gold fillings or in most solid fused inlays.

Dr. F. B. HICKS, Brookline, Mass. "Orthodontia Appliances for Expanding the Arch and Regulating the Teeth."

[This clinic consisted of appliances for the expanding of arches and regulating the teeth by the method described and illustrated in *Cosmos* for February 1906, page 185.]

Dr. A. McALPIN, Bradford. "Anchors."

Dr. McAlpin showed several very ingenious methods of using screw posts for the anchorages of crowns for teeth with broken-down roots, and also for the anchorage of large fillings.

Dr. L. M. HOMBURGER, New York, N. Y. "Gold Inlays."

[The method employed by Dr. Homburger for the making of inlays was the

same as that described above by Dr. Voelkler.]

Dr. E. C. JONES, Philadelphia. "The Anesthetizer."

Dr. Jones exhibited an anesthetizer suitable for the administration of any anesthetic. It comprised a combination face-piece, nose-piece, and mouth-piece. The anesthetic by means of this apparatus may be administered through the nose alone, the mouth alone, or through both the mouth and nose. The apparatus is supplied with valves for the admission and control of air during the administration of the anesthetic.

Dr. D. M. HITCH, Philadelphia. "Invisible Bands for the Correction of Irregularities; also Anchor Bands."

Dr. Hitch demonstrated the making of bands for correcting irregularities, covering them with porcelain body to render them inconspicuous. The bands are made of iridio-platinum, soldered with pure gold, and over this high-fusing body is baked, the band having been roughened so that the porcelain will adhere to the metal.

Dr. E. R. SAUSSER, Philadelphia. "Porcelain Veneering."

Dr. Sausser demonstrated the method of porcelain veneering or hooding of teeth in cases of erosion, peg, or "rice" teeth, etc., as suggested by Dr. Chas. H. Land, with a modification in the preparation, viz, the addition of two grooves, one running axially on each side of the teeth, and of an inclined plane on the tip, giving increased resistance to lingual stress. The veneers were built of high-fusing porcelain on a 1/1000 platinum foil matrix. The advantages claimed for this method are as follows:

(1) Nature's joint, that of the enamel and cementum, is left intact, eliminating the accumulation of foreign materials, etc., under the gum, thus maintaining a healthy condition of the gum and giving the tooth-brush full play at the vital point. (2) Easy access to the pulp-chamber, if needed, without destruction of the veneer, it only covering two-thirds

of the crown of the tooth, the lingual surface being exposed. (3) Absence of metal, and therefore greater tolerance by tooth and gum. (4) Strength and durability. (5) Esthetic qualities. (6) Non-destruction of the pulp.

Dr. C. S. BLAKER, Philadelphia.
"Porcelain Inlays."

Dr. Blaker's clinic consisted in the insertion of inlays by the ordinary method, except that he used Ascher's artificial enamel cement for the setting of the inlays.

Dr. WALTER RICHARDS, Slatington.
"Diatioric Teeth in Crown and Bridge Work."

Dr. Richards demonstrated the use of diatioric teeth in bridge work, without the necessity of subjecting them to the flame. His method of making the attachments for the teeth was to burnish a piece of thin platinum into the opening in the tooth, as when preparing an ordinary matrix. This platinum matrix was then filled with moss fiber gold, over which solder was flowed. It was then used in the building of the bridge in the ordinary way, the teeth being cemented into place after the soldering of the entire bridge.

Dr. H. E. HOSLEY, Springfield, Mass.
"Why the Bridge Binds, and a Method to Insure Success."

The clinician claims that the cause for the bridge binding is the shrinkage occurring in soldering, and to overcome this he cuts the cast, and spreads the abutments apart enough to allow for this shrinkage. The size of the space provided for the shrinkage is of course in proportion to the size of the bridge to be made. A groove is made in the bottom of the cast to insure the proper position of the abutments when the cast is again fastened together.

Dr. W. G. CHASE, Philadelphia.
"Porcelain Bridges and Pinless Crowns."

The clinician demonstrated a method of setting pinless crowns by cutting away the back of Davis or other pinless crowns

and fusing porcelain into the space cut away, with a pin set into the crown. He also demonstrated the making of porcelain bridges by the use of Davis crowns or facings attached to a platinum saddle. In using the Davis crowns, the pins are attached to the saddle, upon which the crowns are set after having cut out the backs of the crowns in order to have a good body of porcelain around the pins and crowns. When facings are used, the pins are attached to a continuous bar and the porcelain is built up and carved to the shape of the tooth. Platinum No. 30 gage is used for the saddle. The Davis crowns are first articulated in order to find the position in which the pins are to be set on the saddle. In crown work the platinum is first burnished to the root; the pin is then set, the crown is fitted, and all attached with wax, removed, and invested, care being taken that the pins may be easily removed from the investment. Porcelain body is then packed into the space cut out of the crowns, and the crown is put into the furnace and baked.

Dr. E. J. DONNEGAN, Scranton.
"Repairing Continuous Gum, Gum Sections, and Facings."

Dr. Donnegan demonstrated a method of mending broken gum sections, overcoming the joint between two gum section blocks, etc. His method is to stick the two pieces together with liquid silic, and then fuse the two together in the furnace. Broken facings can be mended in the same way.

Dr. W. M. FINE, Philadelphia. "A Method of Reproducing the Natural Contour of Teeth on the Lingual and Palatal Surfaces of Artificial Dentures."

[This clinic is practically the same as that described in full at page 551 of the DENTAL COSMOS for May 1906.]

Dr. J. E. DUNWOODY, Philadelphia.
"A Way to Obtain Correctly Occluding Cusps for Gold Caps."

After the band for the crown has been made it is put on the tooth, and after placing in it a small amount of model-

ing composition, the patient is instructed to close the teeth. The band is removed, together with the modeling composition, and the cusp is properly carved to articulate with the opposing teeth and to fit the shape of the band. After removing all the composition from the inside of the band, leaving only the cusp to be reproduced, the latter is placed flat side down on a glass slab, and a mixture of two-thirds plaster and one-third medium marble dust is poured over it. After it has hardened, and without using borax, gold is melted into the impression of the cusp until the latter is full, and is then forced down into the impression with a piece of charcoal to insure the copying of every indentation of the cusp. The resulting cusp will be a perfect reproduction of the modeling composition, and will be found to have the exact circumference of the band and to articulate correctly.

Dr. N. H. MYERS, Wilkes-Barre.
 "How to Make a Perfect Joint Between Root and Porcelain Crown."

After preparing the root in the usual way for the reception of a porcelain crown, place a small quantity of base-plate gutta-percha in the root-canal; then heat the dowel sufficiently to soften the gutta-percha and insert it in the root-canal, care being taken to place the crown in proper alignment with the adjoining teeth. After the gutta-percha has hardened sufficiently, gently loosen and remove the crown and pin from the root, thus forming nearly a perfect mold of the pin in the root-canal, which will serve to hold the crown in the same position in the arch at each subsequent insertion. I now take a small strip of carbon paper, the thinner the better, and make a hole through it with the rubber-dam punch sufficiently large to accommodate the pin. By passing the pin through the hole, returning it to the root-canal, and pressing gently on the crown, your carbon paper will show the parts that touch first. By the use of stones or burs remove these darkened spots and bring the crown to place again, repeating this until the carbon shows itself on the entire

surface of the root or crown; then a perfect joint will exist. Whether one wishes to set the crown with gutta-percha or cement, the previously inserted gutta-percha should be allowed to remain intact in the root-canal.

Dr. W. W. MCKAY, Philadelphia.
 "Porcelain Inlay, Using High-fusing Body."

This clinic consisted of the restoration of the mesial half of a lateral incisor, including the cutting edge. The clinic was for the purpose of demonstrating the translucency and lifelike appearance of high-fusing porcelain, the method of shading an inlay from the cervix to the cutting edge, and the cavity preparation for mechanical retention of the inlay.

Dr. W. A. CAPON, Philadelphia.
 "High-fusing Porcelain Carving."

The carving of molars and bicuspid for practical cases is made by using a foundation of platinum which serves as a gage to show the limit of the crown base. After the base is fitted to the face of the root, a layer of porcelain of dark shade corresponding with the natural neck color of the adjoining teeth is first applied, and over this a lighter shade is added, which will give the color of the tooth proper. The carving is now done with a sharp-pointed spatula, and the manipulation is facilitated by mixing porcelain with a gummy substance such as cornstarch or gum tragacanth. The first fusing reduces the original size about one-quarter, but the second addition of material restores the loss from shrinkage, and secures in the reproduction a tooth of natural character, providing the operator has the artistic tendency required for a successful result.

Dr. V. H. JACKSON. "Orthodontia."
 The clinician demonstrated his system of correcting irregularities of the teeth. He showed the method of constructing appliances, first describing the manner of preparing a cast. An accurate cast is made, and the teeth are carved slightly at the neck, which causes the appliance,

when made, to fit closely, thus insuring good anchorage.

The appliance consists of partial clasps, spring clasps, base-wire, finger springs, lugs, etc., assembled on an accurate plaster model, on which they are finally soldered. Spring-clasp attachments retain the appliance in position by grasping the anchorage teeth. They are made by first arranging partial clasps on the lingual sides of the molars and bicuspid used for anchorage. The partial clasps are made of pieces of 18-k. gold plate, No. 36 standard wire gage, contoured to fit the side of the tooth, usually the lingual side. The gold is roughened on the side on which the solder is to be applied.

The spring clasps are of No. 21 or 20 wire, either of gold, silver-nickel, platinum, or German silver. They are shaped to fit the side of the tooth opposite to that against which rest the partial clasps near the gum. The ends of the spring clasps passing over the arch follow closely at the junction of the teeth, and rest on the partial clasps, to which they are finally soldered. A large wire known as the base-wire or body of the appliance is shaped to cross the arch, following the palatal curve, and the ends of the wire are bent at nearly a right angle, forming the "arms." These arms rest on the partial clasps, to which they are soldered with spring clasps. To this anchorage portion of the appliance, springs of any form are united with solder. They are shaped to extend like fingers for moving any of the teeth in the arch as desired.

The base-wire crossing the palatal arch is termed the palatal base-wire; when it follows the lingual curve of the teeth it is termed a lingual base-wire, and when it is arranged to pass on the labial and buccal sides of the teeth in the arch a labio-buccal base-wire.

The method of soldering with chemically pure tin, using the soldering iron, was described.

Casts and apparatus were presented showing the ease with which the arches of the jaws and teeth are equalized with the Jackson appliances and rubber elastics. Casts and appliances of numerous cases were presented, showing the condi-

tions before and after regulating, and the extensive movement accomplished in from two to eight visits.

Dr. W. C. HOEFFER, Pottsville.
"Method of Making Hollow Inlays."

After having prepared the cavity the same as for a porcelain inlay, viz, avoiding all undercuts, and having all margins as nearly at right angles as possible, the edges are then stoned with the Arkansas stone points. This will correct any and all irregular surfaces left by the bur, and at the same time will allow the impression to be withdrawn more readily.

A piece of "dental lac" or modeling compound is now taken and heated, and shaped into a cone, the base of which is chilled in cold water. (Chilling of the base prevents the compound from spreading over the adjoining teeth.) The point being left soft, it is then pressed into the cavity, and held there until it has been thoroughly chilled with cold water. It is now withdrawn from the cavity; if it does not come away readily, or if there be any drawing of the impression, it is the result of undercuts, which must be corrected before proceeding any farther. The impression is now embedded in Melotte's moldine, well lubricated with some thin oil, and the cast or die is poured of S. S. W. inlay metal.

Upon this the matrix may either be burnished, or preferably swaged, using 1/1000 platinum foil. After the matrix has been completed, a mixture of two-thirds silix (fine powder) and one-third plaster and water is mixed to the consistence of putty, kneaded in the fingers, and pressed into the matrix, leaving the matrix in the die. After it has hardened it is carved away sufficiently on the surface to allow for the thickness desired for the inlay, carving from around the margins of the cavity so that an undercut at these points is obtained. This will give to the finished inlay an undercut to which the cement takes hold.

After the core has thoroughly hardened, moss fiber gold is annealed and pressed into the matrix over the core of silix and plaster, and condensed just sufficiently with a broad plugger so that

it will hold. Sufficient moss fiber is now added to restore the contour. At this point the inlay can be placed in the mouth, and the articulation taken, or, if the work be done out of the mouth, it can be placed on a cast and the proper occlusion prepared. It is now invested in the same proportion of silex and plaster as that of the mixture of which the core was made. The exposed edges of the platinum matrix are now coated with an anti-flux just to the margins of the cavity. Gold solder, 22-k., cut in small pieces, is now placed over the moss fiber, and the flame of a blowpipe is applied and solder added until the moss fiber becomes saturated, the moss fiber taking up the molten solder as a sponge does water. It is now taken out of the investment, replaced on the original die, and with a disk it is finished and subsequently polished. The platinum on the under surface of the inlay is now cut away, and the core taken out, the cavity dried and cement placed in both inlay and cavity, and the inlay pressed to place. It is held there until the cement sets, when the filling will be complete.

This method alleviates the strain on both patient and operator, also the unpleasant use of strips and disks in the mouth, which relief I have found to be a great factor from the patient's standpoint; and it is, at the same time, a great saving in material as compared with the solid gold inlay or filling. The method is applicable to any cavity from which a perfect impression can be obtained. In connection with this description, I would like to state that the patients call in the morning, at which time I prepare the cavities, take the impressions, and fill with temporary stopping. Either the same day, or whenever convenient, I have them return to set the inlays one after the other, as it takes only a few minutes to complete the work after the inlay has been made.

Dr. A. D. GRITMAN, Philadelphia.
"Why an Anatomical Articulator Should be Used."

The word prosthesis means replacement; but artificial dentures do not or-

dinarily fulfil all the conditions that are properly implied by that term. We may imitate the natural teeth in size, shape, shade, and arrangement, and thus satisfy the conditions so far as the esthetic part is concerned, but the effort to fulfil the requirements must stop with this.

Important and desirable as the esthetic or cosmetic features of a dental restoration may be, the question of its usefulness is still greater, and therefore the production of an artificial denture which shall restore to the patient the function of normal mastication as nearly as may be possible becomes of first importance. The proper arrangement and articulation does not, as a rule, receive due consideration. The articulation may seem to be right when the teeth are in normal contact, but the moment the mandible is moved in any way, the teeth will have but a single point of contact, the result being that the atmospheric adhesion will be broken, and the teeth instead of being a comfort will be an annoyance to the patient. The using of a full upper and lower denture, especially, is a mechanical operation, and unless the arrangement of the teeth is based upon a mechanical principle, the patient will not derive the maximum comfort from their use.

The face-bow and anatomical articulator, if used properly, make it possible to obtain an articulation that will give at least five points of contact during mastication. Thus the pressure, being distributed evenly over the curves of occlusion, will hold the lower plate in position and prevent the breaking of the atmospheric adhesion in the upper denture. The use of the face-bow is for the purpose of transferring the bite-plates from the patient's mouth to the articulator, so that the casts will bear to the pivotal points of the articulator the same relation as the alveolar border bears to the centers of the temporo-maxillary articulation; thus placing the casts in a correct anatomical relation to one another.

The upper ten anterior teeth are then arranged in relation to the lower bite, and the lower second bicusps are placed in proper position. Next are set, in the following order, the first bicusps, the ca-

nines, the laterals, and the centrals. As each tooth is articulated, the oscillating motion of the articulator is used to determine its correct position. The lower molars are then arranged on a slightly upward curve known as the compensating curve. The upper molars are properly arranged so that when the mandible is thrown forward, and the bicuspid are raised on the points of the cusps, the central incisors and the posterior teeth

will be in contact; then, as the mandible is moved laterally, there will still be at least five points of contact.

Thus, the arrangement of artificial dentures receiving the proper consideration from a mechanical standpoint as well as from an esthetic point of view, the patient will derive the maximum amount of benefit from them, and the replacement will be worthy the name of a prosthetic operation.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canada, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the Editor, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, FEBRUARY 1907.

EDITORIAL DEPARTMENT.

"THE EDUCATIONAL PROBLEM."

IN this issue appears the paper by Dr. C. S. Butler bearing the above-quoted title, together with the discussion thereon which followed its reading before the Atlanta meeting of the National Dental Association. We dislike to take issue editorially with the views expressed by the author of the paper in question, but as through force of circumstances we were unable to accept his invitation to open the discussion upon the paper at the time it was read, we here take the liberty of expressing an opinion upon the several points raised.

We yield to no man in degree or extent of appreciation of what dentistry has accomplished, in respect for its attainment, or in belief as to its future possibilities as a scientific and humanitarian calling. The story of its achievement is romantic and interesting enough, and the records of the growth of dentistry from its crude beginnings to its present dimensions as an exponent of both science and art are inspiring enough to stand squarely upon their

own foundations of fact, requiring no adventitious aid for their illumination. Hence it is that we think that the author in his opening paragraphs has gone wide of the mark in attributing to the effect of the dental impulse the "marvelous advance in our knowledge of histology, pathology, and kindred sciences, as well as the wide application of antiseptics." For, if it was "men engaged in the study of dental sciences who led the way and gave the impetus to the movement," what becomes of the work of Nasmyth, of Retzius, Pasteur, Koch, Metschnikoff, and the host of scientific minds, medical and otherwise, that were pioneers in the creation and development of our earlier knowledge of these subjects? Or to what place shall we assign the work of Pestalozzi, of Froebel, Seguin, Prang, Krapotkin, Adler, and their co-laborers in the cause of manual training as a means for mind-training? Nor do we agree with the author that the system of instruction now in vogue in dental educational institutions is a peculiar system or of a degree of efficiency "not surpassed in any other field of intellectual activity." Making all due allowances for oratorical effect and personal enthusiasm, this view of dental education strikes us as being rather too roseate in hue, to say the least. Indeed, the defects of the system are apparently the *points d'appui* at which the author's rather radical, not to say revolutionary, suggestions are directed; otherwise why their expressed purpose, as is stated in the beginning of the article, "to effect a complete though perhaps not a perfect change in our entire educational system"?

Dr. Butler's suggestions are four in number. First, he would abolish by gradual absorption and elimination all of our present schools, and substitute therefor dental departments of strong universities with faculties selected by the dental profession. ✖ Second, he would abolish state examining boards, which he regards as being superfluous and of doubtful utility. ✖ Third, he would create a national commission with plenary powers as to location of schools, curriculum of study, and entrance requirements. Fourth, he would provide for general reciprocity among the several states with regard to the license to practice dentistry, by providing that the diploma of his proposed schools, when granted in course and indorsed by the national commission which he suggests, shall be accepted as license to practice in any state or territory in the United States.

These suggestions on the one hand, and the actual situation to be met on the other, seem to us to furnish a striking example of the tremendous hiatus which is popularly believed to exist between so-called theory and practice. The difficulty in this case, as in similar cases which give rise to such an hiatus, is that it is not a theory which is involved, but a suggestion or hypothesis. The obstacles which stand in the way of a practical realization of Dr. Butler's suggestions are numerous, and some of them apparently insurmountable. In the first place, it must be remembered that the group of dental educational institutions which our author proposes to wipe out of existence by a graceful wave of his hand are institutions that have certain vested rights and in the aggregate large property interests. They are conducted by men who are not on the whole animated by utopian ideals, but who while engaged in the work of dental education with at least as much professional pride and interest as those who are endeavoring to make a living at the practice of dentistry, have a natural desire to obtain a reasonable amount of material compensation for their work. Their philanthropy is probably of about normal professional dimensions. They are interested in producing the very best educational result that they can under the circumstances, and among the circumstances is the practical one that they are obliged to find the sinews of war in a financial way in order to carry on the business of dental education. It is therefore practically certain that the owners of these dental educational plants and those engaged in their work could not be induced to fall in with Dr. Butler's project of "gradual absorption and elimination" unless in the course of this metabolic process provision were made for compensating them for the material loss which such a process would otherwise entail. It is doubtless quite probable that in the evolution of events the development of higher educational ideals and the consequent elaboration of the curriculum, with the added cost such elaboration necessitates, will slowly bring about the elimination of the unfit among dental educational institutions, just as evolutionary processes succeed in eliminating the unfit in a biological way. But we think that the factor above referred to, viz, the vested rights and interests of the dental colleges, will continue to act as an insuperable obstacle to any sudden or drastic movement tending to eliminate them or

absorb them otherwise than as the eventual process of evolution shall determine.

We disagree with the author's views with respect to state examining boards and their usefulness. Indeed, we should regard the elimination of the state examining board principle as one of the direst calamities that could befall dental education. It is not the legitimate functioning of the examining board that is of doubtful utility or superfluous; it is the ignorant or mistaken use of the state board principle which is the cause at times of friction. Let it not be forgotten that the state examining board is in principle an executive body, not legislative; the warrant for its activities is the dental statute, and the dental statute is or should be the crystallized sentiment of the dental profession of the state with respect to the qualifications that shall be demanded of the practitioner of dentistry and the limitations which shall surround him in the exercise of his profession in a given locality. The dental profession can have any kind of a dental law that it desires to have, provided always that what it desires is what in the nature of the case it ought to desire; and if the dental law of a state is imperfect, if it does not accomplish what it ought to accomplish, and if the board executing imperfect laws becomes a source of irritation and annoyance to the dental profession, then the said dental profession has no one to blame for the state of affairs but itself. We have repeatedly contended in these pages that the state laws through their executive boards are not a detriment but a help to dental education. The openness of their proceedings, as a rule, and their power to examine into the educational product of the colleges, creates and maintains a most healthy stimulus upon the part of the educating bodies, tending to improve their work and accomplish the definite purpose for which the state dental law was enacted, viz, to protect the public from the baneful effects of incompetent dental practice, which includes likewise the protection of the public from the baneful effects of imperfect dental education. No dental college conducting its work honestly and thoroughly should object to having that work passed upon by a competent board of revision, nor should any right-thinking student object to the additional examination which the state board imposes for license after he has passed the faculty examination for his degree; for in both instances the result is an indorsement of fitness equiva-

lent in character to the favorable report of the bank examiner who has passed upon the condition of a bank and found it to be satisfactory—a result which inspires public confidence and which is in no small degree the warrant for public patronage. Acting under a correctly framed dental law, its board of examiners becomes the connecting link between the dental profession and the dental educational system—the agent of the dental profession, whose duty it is to see that the educational system is efficiently working and turning into the ranks of dentistry graduates who will not discredit it. If the machinery of dental education fails to accomplish this result the fault is in the construction of the machinery or its operation, and not in the principle upon which the creation of the machinery is based.

Dr. Butler proposes to reverse this method and go back to first principles by creating a national commission with plenary powers; that is to say, to get rid of all boards but one and make that a national board. If such a step were feasible, it is a highly debatable question whether the single national board would have any particular advantage over the many state boards, for the reason that it would involve the concentration of power in a small body of men who—be they the best of their kind, the flower of the whole profession—would still be human beings susceptible in their degree to the insidious temptation toward autocracy and that enlargement of the cranium which has been denominated *megalocephalus*, called by the vulgar “swelled head,” and with the temptation, in view of the tremendous possibilities of their powers, to exercise them either in an autocratic, bureaucratic, or faddish way to the detriment rather than to the betterment of the situation.

But one of the functions of this proposed national board, as stated in the fourth suggestion of the author, is that they shall indorse the diplomas of these selected and idealized schools, and that when so indorsed the said diplomas are to be accepted as a license to practice in any state or territory of the United States. We should be glad if it were unnecessary for us to reiterate, as we have many times done in this journal, that the creation of a national board having such powers as Dr. Butler suggests could not be accomplished without an amendment to our federal Constitution for that purpose. The main obstacle in the way of secur-

ing such an amendment to the police power clause of the federal Constitution is that if it were done for dentistry or medicine or any department of the art of healing, it would establish a precedent which would open the door for an interference with the police power clause that would create irresistible antagonisms throughout the nation by direct interference with the so-called states rights. This has been tried and is constantly being tried in other departments which bear directly upon the question of the police powers of the states, and hitherto without success so far as we are aware. In the absence, then, of a constitutional amendment conferring the plenary power that Dr. Butler advocates, the commission could have no power at all, and would be a national commission only in name, with nothing more than a moral status and possibly the force of professional opinion back of it to enable it to carry on its work. Reciprocity, as we have many times pointed out—and we have no reason as yet to change our opinion in regard to that matter—can in the absence of a constitutional amendment only be achieved upon the principle of uniformity of dental legislation throughout the states of the Union. Upon any other basis reciprocity if forced to an issue would result, as was very clearly stated by Dr. L. D. Shepard of Boston in the report of the committee on the address of the President of the National Dental Association at its meeting held in Saratoga Springs, N. Y., in 1892, by “leveling downward rather than leveling upward.”

We have discussed Dr. Butler's paper at some length in order that some of the objections to his plan which seem to us important may be considered in connection with the other points which have been brought out in the discussion thereof, and because we do not wish these suggestions to go forth and possibly give rise to activities based upon the false hope that the difficulties, imperfections, and unsatisfactory conditions connected with dental education and the license to practice dentistry are to be corrected in any such summary manner.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Archiv für Zahnheilkunde*. Berlin, November 1906.]

SOME USEFUL REMEDIES. BY H. W. C. BÖDECKER.

In the communication under the above title, the author discusses among other agents cocain phenate and a preparation which he designates as "zinc iodid." Cocain phenate is prepared by adding to a small quantity of carbolic acid—say about 5 cc.—an equal volume of crystals of cocain hydrochlorid. As soon as the latter are dissolved more cocain is added, until the carbolic acid is saturated. Some undissolved cocain crystals should remain at the bottom of the container, while the supernatant liquid should be perfectly clear, and of a thick syrupy consistence.

Cocain phenate may be used to advantage as an application under the gum before removing deep-seated calculi from the roots of teeth affected by pyorrhea; as an application to relieve the pain caused by the entrance into the mucous tissues of a hypodermic needle; for the relief of pulpitis; to relieve the sensitivity of pulp-remnants after partial extirpation under arsenic; in the treatment of post-extraction pain, ulcers in the mouth, etc., and to diminish the pain caused by ligatures, by clamps, etc. Generally speaking, whenever pain results through injury to the mucous membrane in the course of operations, cocain phenate judiciously applied will be found to be a useful agent, being obtundent as well as antiseptic.

Another remedy to which Dr. Bödecker calls attention is an iodine preparation, which according to his opinion acts better than tincture of iodine, iodine and carbolic acid, or iodine and aconite. For the sake of convenience it has been termed "zinc iodid," although properly speaking it is not exactly that. This so-called zinc iodid was, as nearly as can be ascertained, first recommended by Dr. A. L. Northrop of New York in 1877. It is pre-

pared by mixing a saturated solution of potassium iodid with an equal volume of a saturated solution of zinc sulfate, and iodine crystals to complete saturation are added. The iodine crystals must be added immediately after mixing the two solutions, for otherwise but very little of the pure iodine will pass into solution. The author employs this preparation after the removal of calculi, even in the presence of healthy gum, that the latter may more perfectly adapt itself to the necks of the teeth; whenever the gum is inflamed, appears purplish, and bleeds easily; in the treatment of pyorrhea alveolaris and aphthous stomatitis. In the latter disturbance, if the zinc iodid be preceded by treatment with cocain phenate no pain will follow its application. It has also been found to give satisfactory results in the treatment of sensitive dentin at the necks of teeth, whether due to erosion or caused by the metal clasps of dentures.

[*Archives de Stomatologie*, Paris, September 1906.]

SUBLINGUAL LEUCOKERATOSIS. BY DR. J. V. ROY, MONTREAL, CANADA.

The essayist describes the case of a man who sought his services for the relief of a peculiar condition of his mouth. For a period of two years prior to his visiting Dr. Roy, the patient had observed a progressive hardness of the tongue, which, although causing a prickly sensation, did not interfere with mastication or deglutition.

Upon examination it was found that the disease, which had originated in the gum, had now spread to the floor of the mouth. The sublingual mucous membrane on the left side was the seat of a pseudo-cartilagenous degeneration, and the gum on the corresponding side—which was likewise undergoing a similar degenerative change—was covered by grayish bands, which projected beyond the

gingival surface. On the right side, with the exception of a decolorized area of the size of a ten-cent piece, simulating the effect of cauterization with silver nitrate, no pathological sign could be detected. The clinical history and habits of the patient were good. He had never made use of either alcohol—in any of its forms—or tobacco, but his teeth had been badly neglected, many of them having been rendered useless by caries. The case was successfully treated by means of several applications of the galvano-cautery, and the leucokeratosis disappeared completely.

In concluding his communication, the author comments on the obscure etiology of the lesion.

[*Archives de Stomatologie*, Paris, September 1906.]

CONGENITAL FISTULÆ OF THE LOWER LIP. BY DR. A. STIEDA.

The author has observed the case of a young child who presented, in addition to a hare-lip and complete palatal cleft, two small sinuses symmetrically located on each side of the median line. The sinuses opened on the external surface of the lip, and terminated backward in a cul-de-sac under the labial mucous membrane. One of these canals was extirpated and examined microscopically. Its opening and anterior segment were histologically of the same character as the free surface of the lip; while the posterior segment was constituted of elements similar to those of the buccal mucous membrane. These fistulæ are very rare, thus far only twenty cases having been recorded.

The ancient authors, such as Demarquay and Béraud, attributed them to disturbances in the mucous glands during fetal life; while Rose and Madelung traced their pathogenesis to an arrest of development. In their opinion the mandible is developed from two lateral and a median segments, and if the three portions do not become consolidated, one or two fistulæ may result.

Stieda does not accept the developmental theory, for he claims that at no time are there to be found in those locations any canals, such as would be by not becoming united give rise to the formation of sinuses. In his opinion it is due to a faulty development of the lip. It could not be due to a non-

fusion of the two arms of the first branchial arch, for as a matter of fact this arch is from the beginning formed from a single piece, and not by a fusion of its halves. But, on the upper or cranial border of the mandibular arch, at the expense of which the lower lip is formed, there appear at times, as the result of uneven development of the upper border, two, and at other times four, small lobes separated from each other by three sagittal grooves. If the growth of these lobes should be exaggerated, it is easy to understand how they might unite to form the canals observed in the case here recorded. As the grooves extend throughout the thickness of the mandibular arch, when from the latter structure the differentiation of the structures of the lip takes place, the structure of the canals will also undergo differentiation, the anterior portion and external opening assuming the characteristics of the external surface of the lip, and the posterior portion that of the oral mucous membrane.

[*Dental Practice*, Toronto, October 1906.]

A PORCELAIN TIP. BY FRED R. MALLOY, TORONTO.

The author advocates the substitution of the tip of an incisor with porcelain by a method which he describes as follows:

Preparation of the cavity. First square up the edge of the tooth and make it as flat as possible, and with a sharp round bur cut out part of the dentin. Take out the fullest width it will stand without weakening the enamel, and make the walls of the cavity parallel and at right angles with the floor of the cavity.

Matrix and staple. To assist in retaining the tip a staple is used of 24-gage iridio-platinum wire, wide enough to reach the floor of the cavity, and long enough to extend from the cavity about three-fourths the length of the tip. The ends of the staple should be bent outwardly. Cut a piece of 1/1000 platinum foil—well annealed and sufficiently large to cover the end of the tooth—and burnish it over the end of the tooth and into the cavity. The platinum will be punctured in the cavity, but that will only further the ultimate purpose of the method.

Application of the porcelain. The staple is now put in place, and a foundation body, slightly darker than the tooth, is added. The

porcelain is forced into the cavity and enough is put on to cover the ends of the staple. The whole is now carefully dried, removed, and biscuited. After the biscuit bake, care should be taken to see that there is a slight opening between the porcelain and the top of the staple. It can now be put back, re-burnished, and enamel body of the color of the tooth added and fused until the required length and contour are obtained.

[*American Journal of Surgery*, New York, September 1906.]

AN INTERESTING CASE OF CONGENITAL MALFORMATION OF THE MOUTH.

By E. K. MACOMBER, B.S., M.D., AMSTERDAM, N. Y.

The author reports the case of an infant which at birth presented several curious malformations. The first abnormality observed after the birth of the head was a tumor protruding from the mouth. Next a lower incisor was seen. The tumor was found to be about one inch in length and one-half inch in diameter, and was attached to the roof of the mouth opposite the maxillary suture, near its middle point. The tumor was covered with skin and lanugo, and its free end protruded just beyond the lips. The tooth was as perfectly formed as in a child two years of age, except that it was freely movable, there being no alveolar process to support it. On raising the tumor and looking into the mouth, there were found two completely formed tongues, each with a median raphe and a separate frenum, but with a single root. The inner borders of these tongues encroached upon each other in the median line of the mouth, causing their edges to be slightly raised and bringing their under surfaces into apposition for a short distance from their bifurcation. From underneath these edges, and springing from their bifurcation, was a third or rudimentary tongue, which extended down between the other tongues to an equal distance, separating them at their distal extremities, thus giving the appearance of a three-lobed tongue. This median lobe was broader and thinner at its distal than at its approximal end, and had no distinct frenum or median raphe, yet it showed the papillæ on its dorsum the same as the other tongues.

As the mouth was so full that it was

difficult for the child to breathe or receive nourishment, Dr. Macomber removed the tooth, placed pedicle ligatures on the tumor and rudimentary tongue, and removed them at once. After these were removed, a more thorough examination of the mouth could be made, and this revealed two soft palates and two uvulæ. Each soft palate extended upward from the pillars to the median line, where they formed by their union almost a right angle. From the middle of each velum came the uvulæ, extending downward and inward. On each side of the tumor and posterior to the base of it was a groove about one-eighth inch deep, giving the impression that the tumor had sprung from between the maxillary bones, and had prevented their union at this point. Behind this, however, union was complete, and consequently there was no cleft of the palate. On account of the bifurcation of the tongue, the child was unable to nurse, although its attempts were vigorous. Otherwise the child was well formed and weighed six pounds. The tumor was examined and was found to be a lipoma covered with normal skin.

The author operated successfully on the tongue, cutting each frenum and removing sufficient from the inner borders to leave a normal size tongue when united. Before the operation the child was unable to cry aloud, but immediately after the tongue was sutured it could cry as lustily as any other child. Its prospects for being able to talk were good, for the roof of the mouth was in good condition; there was ample room in the pharynx and the tongue was of normal size and shape. Unfortunately, however, the child was taken with whooping-cough, and died at the age of four months and twenty-three days. This is apparently the only case on record of two palates and two uvulæ.

[*La Revue de Stomatologie*, Paris, October 1906.]

ON THE INFLUENCE OF SYSTEMIC CONDITIONS ON CERTAIN SERIOUS COMPLICATIONS OF DENTAL CARIES.

By DR. V. GALIPPE, PARIS, FRANCE.

In the present article Dr. Galippe discusses one of the most important phases of dental pathology, namely, the complications of dental caries as affected by the systemic condition of the patient. The severity of this

class of disorders depends not so much on the intensity of the local infection, as it does upon the constitutional state, i.e. the ability of the human economy to repulse the attack of the invading organisms. He describes several interesting clinical observations of patients in whom the severity of the caries complications were out of proportion to the degree of local infection. From among these observations we republish the following in full, as being a typical portrayal of the pathological phenomena which the author has elucidated:

Multiple abscesses of the face in the region of the neck, presumably caused by the root of a lower molar. In June 1891, he was called in to examine a patient, aged forty years, a restaurant waiter by occupation. Since November 1890 he had been suffering from a series of abscesses, the cause of which up to that time remained obscure. The right side of the face was red and edematous, and presented a number of cicatrices, several of which were fistulous and discharged in abundant quantities pus of a serous character. The orifices of the fistulae were fungous. The eye was partially closed, owing to the presence of an abscess upon the lid. The patient had been in this condition for seven months prior to the examination. The onset of the trouble was marked by toothache, originating in several teeth, and by swelling of the right side of the mandible. The attending physician ordered the application of poultices and of iodin ointment on the painful area, but this treatment was without avail.

Later on he entered the surgical ward of the hospital, and was subsequently operated upon with the view of draining the part. He remained there for ten days, but, as his condition did not improve after leaving the hospital, he was compelled to return six days afterward. He was again operated upon, the operation consisting, as in the previous instance of an incision over the swollen area.

He remained in the hospital a month, but upon leaving, his condition still remained unchanged, and it was only after waiting another month that he decided to follow the advice of his physicians and submit to the extraction of a number of the supposedly offending teeth. This time he likewise waited a month, and finding that no improvement was noticeable, again applied for admission into the hospital, where he remained for several months before coming under the writer's observation. All upper and lower carious teeth had already been removed. Owing to a marked contraction of the masseter muscles, it was found necessary, in order to extract the teeth, to slit the tissues from the commissure of the lips to the anterior border of the masseter. The tissues overlying the maxilla were dissected away, and a number of fungosities were removed from the alveolar groove.

Notwithstanding the number of surgical interventions to which the patient had been subjected, his condition still remaining stationary, his mouth was again carefully examined, this time by Dr. Galippe, who found a small root hidden under a gingival fungosity, which had escaped the attention of the previous practitioners under whose care the patient had been. By means of antiseptic washes frequently applied, the contraction of the masseters was greatly reduced, thus enabling him to remove the offending organ, which proved to be the anterior root of the lower right first molar. After the extraction the patient improved rapidly and eventually recovered.

This case shows plainly what the effects of an alveolar abscess, the result of caries, may be in individuals offering a suitable field for the development of micro-organisms. The patient under discussion was probably an alcoholic, and in addition the state of his health had always been below par.

PERISCOPE.

Soldering Clamp.—The clamp made of iron wire is just the thing to hold two pieces of metal or in wiring a plate. Take iron wire one and one-half inches in length, about No. 16 gage, flatten the ends, and with flat-nosed pliers double-flare a loop at the end.—DR. HASKELL, *Dentist's Magazine*.

To Reduce the Pain Incident to the Removal of Calculi.—For the purpose of reducing the pain incident to scaling, I recommend packing the pocket with a rope of cotton saturated in a one per cent. cocain-adrenalin solution and allow it to remain five minutes.—ELGIN MAWHINNEY, *American Dental Journal*.

Perfectly Swaged Cusps.—After a piece of gold has been swaged into the lead counter-die, remove and anneal it, and place it back in the counter-die, with a piece of rubber dam doubled between the lead counter and the gold. Place the die in position and strike hard. The cusps will be found very sharp and close-fitting. Take care not to get the rubber between the gold and the die instead of between the gold and the lead counter-die.—J. S., *Pacific Dental Gazette*.

Preparing Sensitive Cavities.—A comparatively painless method of cutting away a large body of sensitive dentin consists in running the stones or burs under water. I think that about the most painful thing which could be done to a patient is to run a bur at a high speed in a dry cavity. I am able to do this so-called heroic cutting by running a stream of water upon the bur or stone run at a high rate of speed.—E. J. PERRY, *Dental Review*.

Strength of Tincture of Aconite.—The most important change in the strength of tinctures is that of Tinctura aconiti. This preparation in the U. S. P. of 1890 was directed to be thirty-five per cent. In the U. S. P. of 1900 it has been reduced to ten per cent. It is well to keep this change in mind, for tincture of aconite is an important constituent in liniments used in the local treatment of many diseased dental conditions, especially pericementitis and facial neuralgia.—J. P. BUCKLEY, *Dentist's Magazine*.

Hints to Avoid Wrongly Placing the Cast on the Articulator.—A cast may be placed wrongly on an articulator in various ways, thus: (1) By being placed too far forward or too far back; (2) by being placed so that the plane of occlusion of the teeth will not be directed to the joint; (3) by being placed askew, so that its heels are not equi-distant from the joint adjoining each; (4) and by being tilted, so that the left side is higher proportionately than the right side or *vice versa*. And lastly, the error may be in a combination of one or more of these four malpositions.—STEWART J. SPENCE, *Dentist's Magazine*.

Origin of "Doctor."—The term "doctor" was invented in the twelfth century, about the time of the first establishment of universities. The first person upon whom this title was conferred was Irnerius, a professor of law at Bologna University. The title was created by Emperor Lothair II, but was suggested by Irnerius himself. The term extended to the faculty of theology, and was first given by the University of Paris to Peter Lombard, the famous theologian. In 1329 the College of Asti conferred the first title of doctor of medicine upon William Gordenio.—*Medical Fortnightly*.

Cusps for Bridge Teeth.—Another method of forming cusps on bridge-teeth other than swaging in gold plate, and which I consider much stronger than the latter, is the following: Having the gold crowns on an articulator, grind the facings, and back them with pure gold, as usual flowing a "starter" on the occlusal tip to insure perfect results; after filing the pins more than half in two, and bending over firmly, burnishing a last time to insure perfect adaptation, wax the facings *in situ*, forming all the occluding cusps, and while the wax—Parr's hard wax flux is excellent for waxing all cases to be soldered—is still soft, bring the occluding teeth down into the wax in the normal bite-position; trim the cusps up, as you would for a seam crown, invest—I find three parts yellow ochre and two parts model plaster very good as an investing material, with no hazardous effects—and heat well, being sure to get the case sufficiently hot, and flow your

18-k. or 20-k. solder right into the cusps formed. If properly heated, a few touches with a small carborundum stone will give you pleasing results and a firm, substantial piece of work, with no air-space between the solder and swaged cusps. I find it is always better to leave quite a heavy cusp to take the strain in lieu of the facing. For final polishing of crowns and bridge work I have found nothing more satisfactory than electro-silicon.—**SYDNEY A. SMITH**, *Pacific Dental Gazette*.

Therapeutics of Pyorrhea Alveolaris.—

In all cases of deep pockets, difficult of access, I simplify the work by previously packing the pocket with gauze saturated in twenty-five per cent. phenol-sulfonic acid—or aromatic sulfuric acid will often do quite as well. The packing should be left for twenty-four hours, when the gum will be crowded away from the tooth-neck where the pocket is, so as to enable one to see to a great extent exactly what is being done, and to scale the root without much pain or laceration of tissue.—**ELGIN MAWHINNEY**, *American Dental Journal*.

Treatment for Sensitive Cavities.—

I have frequently been surprised at the results obtained from sealing in a sensitive cavity a preparation of equal parts of oil of cloves and carbolic acid, to which has been added twenty grains of cocain to the ounce. I have found many times that after this preparation has been in the tooth for twenty-four hours, I have been able to prepare extremely sensitive cavities without causing any pain whatever. I do not claim that this will answer in all cases, nor that it is a method to be relied upon to any great extent, but I do know that it is well worthy of consideration, and one which, if followed, will make all cavities less sensitive for exploring purposes.—**W. G. E.**, *Dentist's Magazine*.

Controlling a Hypersensitive Palate When Taking Impressions.—

A gentleman, about sixty years of age, called at my office, claiming that he had been unable to get a set of teeth because no dentist had been able to get the impressions, his throat and palate being so sensitive. The last dentist he had visited, after trying cocain as a spray, and various other methods, told him to go home and tickle his throat with a long feather. This he did, with the result that his stomach and nervous system were in a very bad condition when he applied to me. I was once advised by a physician to use chloretone in such cases. After giving the man the following doses of chloretone, I was enabled to take my

impressions with no unpleasant symptoms whatever. I gave him three powders of chloretone, each containing five grains, and directed him to take them as follows: upon getting up in the morning he was to take one powder; two hours thereafter another, and eat a very light breakfast, after which he was to take the last powder, and report to me. When he arrived at my office I gave him a very small dose of chloretone—say two grains—and proceeded to take my impressions, as I have stated, without the least trouble. The man will sing my praises for doing what so many failed to do, and which they could have done had they only used chloretone. To any one who may ask, I would be glad to recount my experiences in other cases in which I have used this most important compound.—**A. E. FRANKLIN**, *Dental Register*.

Iodin as a Germicide.—In a solution of iodine varying from 0.2 to 1 per cent., we have a very potent germicidal agent, far superior to mercury bichlorid—the acknowledged leader of all other antiseptics. It approaches nearly to the ideal antiseptic in that (a) it is easily prepared and is stable; (b) is non-toxic and non-irritating, in the strength effective, being only one-fourth as toxic as mercury bichlorid; (c) it does not coagulate albumin or form inert compounds with tissues; (d) it is effective in a very brief time; (e) the stain it produces soon disappears; (f) last and most important, it possesses a remarkable penetrating power. A 0.5 per cent. solution is amply strong for all practical purposes.—*St. Louis Medical Review*.

A Few Ideas on "Taking the Bite."—

In "taking the bite" the greatest difficulty to be overcome is the tendency the patient exhibits—apparently from over-anxiety to do the thing right—of protruding the mandible in closing, and this is particularly the case if the term "bite" is used in giving instructions to the patient as to how to close the jaws. Avoid the term "bite," then, and instead, direct the patient to turn the tip of the tongue upward and backward as far as possible. It is well to have the patient do this a time or two before placing the trial-plates in position in the mouth, also after these are in position. Then, when the patient understands what is required of him or her, and the tip of the tongue is back, as far as it can go, direct the patient to "close the jaws." This "upward" and "backward" movement will be found to follow the median line of the vault of the oral cavity directly, as we cannot place the tongue's tip upward and backward as far as possible without follow-

ing the median line, and this overcomes the side bite—either to the left or to the right. It is therefore an inadvertent act on the part of the patient. Moreover, this method brings into requisition all the muscles which are connected either directly or indirectly with the tongue, and I might say that these are many—the genio-hyo-glossus, the hyo-glossus, the stylo-glossus, the stylo-pharyngeus, the middle constrictor of the pharynx, the stylo-hyoid ligament; and even such muscles as the mylo-hyoid, digastric, sterno-hyoid and omo-hyoid seem to be indirectly concerned. All these muscles, by this method, seem to be employed in bringing the mandible into its normal relation to the maxilla, and in so doing they all seem to act together.—W. NELSON CUTHBERT, *Dental Practice*.

The Mixing of Zinc Oxyphosphate Cement.—The problem of mixing a zinc oxyphosphate cement is one which must be largely worked out by the individual operator. One cognizant of the proper feel of the cement beneath the spatula is in position to get good results. In a general way, some points of value can be given. Most often cement does not receive enough of careful spatulation, yet it can be utterly ruined by over-spatulation. Too little spatulation gives a quick-setting, granular result, and over-spatulation gives cement which will never properly crystallize. Thus it can be seen that these features must be kept in mind, and that the operator must become familiar with the proper feel of the cement beneath the spatula.—W. V-B. AMES, *Dental Era*.

A Liquid Preparation of Iodoform.—M. Blanchi has published a formula for the preparation of iodoform in a liquid state which from a therapeutical point of view offers certain advantages over an emulsion of iodoform. It is a syrupy, yellowish liquid, having an odor of iodoform, and is miscible with water, alcohol, ether, glycerin, chloroform, essential oils, benzol, eucalyptol, and creasote. It dissolves guaiacol and several other drugs, and is easily absorbed through the skin, iodine having been found in the urine six hours after the application of the liquid. It is easily prepared by dissolving 35 parts of caustic potash in 25 parts of water, adding first 50 parts of oleic acid and 30 parts of 95 per cent. alcohol, and then 30 parts of iodine in small portions. On warming the mixture, iodine is absorbed, and a brownish liquid is obtained. If necessary, the brown tint may be destroyed by the addition of a few drops of caustic potash. After a few days the liquid is decanted and kept in a dark place.—*Lancet*.

Apply the Forceps Carefully and thus Avoid Serious Mishaps.—One of the errors most frequently made is hastening to apply the forceps as soon as the tooth or root has been condemned to extraction, without making sufficiently careful examination of the case. The fracture of teeth or roots often results from the too hasty and inconsiderate application of force—a mishap that may be avoided by first making a thorough study of the case. Frequently too much force is applied, or too much cutting of the alveolar process, when a testing of the solidity of the root before applying the forceps would have revealed its weakness and perhaps have led to a different method altogether—possibly the elevator instead of the forceps. The careless operator has often felt shame for the heroic bite he has taken with the alveolar forceps to extract a contemptible little stump that he could easily have overturned with the elevator.—*Exchange*.

Little Helps.—When polishing posterior fillings, to avoid scratching the mirror, and to keep tongue and cheeks away while doing the work, I find nothing better than a medium size teaspoon. Insert it always with the concave side toward the surface to be polished, and you will find with what ease the work can be accomplished, and will be surprised at almost complete shutting out of saliva.

After temporary stopping has been inserted in an approximal cavity, take a fine polishing strip, moisten it with eucalyptus oil, and pass it into the embrasure to and fro several times. The filling will become smooth and a better retention will be secured.

A few drops of compound tincture of benzoin rubbed on the hand will prevent the forceps handles from slipping, which they do many times on sultry and muggy days.—GEORGE ZEDERBAUM, *Dental Register*.

The Frequency of Caries and its Relation to the Quality of Bread Used.—It is well known that in all civilized countries carious teeth are extremely common. There is no reason to believe that the evil is greater in Germany and Switzerland than it is here, but it has received much more attention in those countries than here (England). Examinations of a large number of children in elementary schools showed that in Aschaffenburg 99 per cent. of the whole number had decayed teeth, and that on an average the children with such teeth had 33 per cent. of their teeth decayed. The proportions in Berlin were 99 per cent. and 31 per cent.; in Freiburg 99 per cent. and 35 per cent.; in Augsburg in 1904, it was found that only

0.59 per cent. of the scholars had teeth free from decay. The Strasburg authorities examined 4000 scholars in 1903; 97.5 per cent. of the children had decayed teeth, the average proportion of bad teeth being 31 per cent. Bad teeth are not only an effect of wrong conditions, but are also a cause of innumerable other evils. For example, in Strasburg, decay of the teeth was accompanied by swelling of the glands in the neck in 70 per cent. of the children. In 1902 the first German school dental institution was opened in Strasburg for the gratuitous treatment of children's teeth. In the second year of its existence 6900 children had their teeth examined, 4822 teeth were filled, and 6530 were extracted. This systematic examination of children's teeth has led to a striking and very impor-

tant discovery. There is an orphanage for girls in the town, in the dietary of which good hard rye bread forms a part. Some of the girls have been in the orphanage since they were two or three years of age—that is, from an age when they still had their first, or deciduous teeth. These girls have faultless teeth. But some others of these girls had lost their deciduous teeth before they entered the orphanage; they have a considerable number of decayed teeth. These facts seem to prove the soundness of the belief held by a good many observers, that the quality of the permanent teeth depends in great measure on that of the deciduous teeth, and that if the latter are to remain sound, they must be well used.—T. C. HORSFALL, *Dental Record*.

HINTS, QUERIES, AND COMMENTS.

A METHOD OF RESETTING A BRIDGE WITHOUT REMOVING IT FROM THE MOUTH WHERE ONE OF THE ANCHORAGE POINTS HAS BECOME LOOSENED.

Mrs. M. presented herself to me for treatment. On examination I found a bridge extending from the upper right canine to the left canine, and thence to the second molar. The canine roots were supplied with Richmond crowns and the molar with a gold crown. The left canine had loosened and the weight and leverage were so great that the molar had also become loosened and would drop out of the socket as far as the bridge would allow—that being about half the length of the root. There was a profuse discharge of pus from the molar socket. The molar crown was tight to the tooth, and it would have been an impossibility to have split the crown and removed it without risk of the tooth dropping out of the alveolus.

The right canine being tight, I decided to drill through the gold on the lingual surface of the left canine crown. After drilling through the solder and cap of the Richmond, I extracted the loose post and fitted a Justi post through the gold into the canal. After

sterilizing the root and cap, I cemented the post in position, holding the bridge until the cement had hardened. I then drilled a pocket around the end of the post, saturated the same with phosphoric acid, and filled the pocket with quick-setting amalgam. I then began the treatment of the molar socket, using the compressed-air atomizer with a Parke-Davis hypodermic needle as a nozzle, and washed the socket once a day with dioxogen, glyco-thymolin, and campho-phénique. The composition of the formula is as follows:

Campho-phénique,	3j;
Dioxogen,	3j;
Glyco-thymolin,	3iij;
Water,	q.s. ad 3vj.

After twelve treatments the abutments of the bridge were firm and in correct position.

With the small nozzle on the atomizer it is not difficult to reach the apex of the socket, and to wash out all pus and foreign matter, thereby stimulating a healthy granulation. The detachable point of a Parke-Davis hypodermic needle passed through a small piece of unvulcanized rubber and placed in the tip of an atomizer is useful in treating pockets around the teeth, as well as fistulous tracts.

P. NEFF MYERS, D.D.S.

Allegheny, Pa.

OBITUARY.

DR. JOSEPH L. PERKINS.

DIED, at, St. Johnsbury, Vt., March 19, 1906, of heart failure, JOSEPH L. PERKINS, D.D.S., M.D., in his seventy-second year.

Dr. Perkins was the son of Joseph and Lucretia K. (Hovey) Perkins, and was born in Brookfield, February 9, 1835. He was educated at the public schools and Newbury Seminary, and when the Civil War broke out was a student in the medical department of the University of Vermont, from which institution he eventually received the degree in medicine. He enlisted in the First Regiment Vermont Volunteers, and was a participant in the first engagement of the war at Big Bethel, Va.

Choosing dentistry as his profession, he was graduated from the Pennsylvania College of Dental Surgery in 1862. He married on November 6, 1862, Miss Abbie J. Peck of Barre, a sister of the late Rev. Dr. J. Oramel Peck, an eminent Methodist bishop. Dr. Perkins came to St. Johnsbury in 1863, and for over forty years was a successful practitioner of dentistry in that locality.

Dr. Perkins was an enthusiastic and able worker in the ranks of his chosen profession. His professional attainments and general learning were upon more than one occasion suitably recognized and appreciated by his colleagues and co-workers, by intrusting to him the discharge of honorable offices in the several professional associations and secret orders of which he was a member and indefatigable supporter.

He had held membership in the Vermont State Dental Society, and was its presiding officer for several years. He was likewise during several annual terms a member and also president of the Vermont State Board of Dental Examiners.

Dr. Perkins was a contributor to the literature of his profession, his literary productions being on record in several of the dental periodicals of the country. A man of genial temperament and kind disposition, friendly instincts, and sympathetic nature,

the territory of his worldly activities was made brighter by his presence therein.

In passing to his eternal reward he has left in the hearts of friends and acquaintances a vacancy which time will but partially obliterate; but the stimulus of his example will continue to work out its influence in the lives of those who knew and loved him, tempering the sorrow of their loss and strengthening them in those qualities and virtues which make for good and helpful citizenship.

He is survived by his devoted wife, a son, Karl D., a daughter, Miss Isabel W. Perkins, and a sister, Mrs. Charles Cook.

DR. FRANCIS D. NELLIS.

DIED, at Syracuse, N. Y., November 19, 1906, of heart failure, FRANCIS DAVIS NELLIS, M.D.S., in his seventy-second year.

Francis David Nellis was born in the town of Seward, Schoharie county, N. Y. October 1, 1835, of Dutch ancestry. His father, Joseph Nellis, served in the war of 1812, and his mother, Dany Dewey, was a relative of Admiral Dewey.

He began the study of dentistry in the office of his brother, Jacob Nellis, M.D., D.D.S., in Schoharie county, and practiced in Schoharie, Delaware, and Otsego counties prior to his going to Syracuse in 1866, where he was engaged in active work till October 6, 1906.

In early life he married Eva Eliza Gardiner of Schoharie county, who died August 13, 1883. He was a member of the Masonic Fraternity, Syracuse Lodge, No. 501, of the Masonic Veterans of Central New York, and of the Citizens' Club.

Dr. Nellis was a contemporary of Westcott, Palmer, Smith, and Barnes, and a pioneer in the history of the New York State Dental Society, the Fifth District and the Syracuse Dental Societies, and a loved and honored worker in the front rank until the last. A banquet was given in his honor by the Syra-

cuse Dental Society upon the completion of his fiftieth year of dental practice.

He was conservative, steadfast, and consistent, and these qualities, combined with a devotion to the best interests of his chosen profession, made him a source of inspiration to his fellow practitioners, to whom he endeared himself by his genial and friendly nature.

After an illness of six weeks, he died at his home of heart failure, leaving two children—Franklin Dewey Nellis of Auburn, and Mrs. Louie Fritcher of Syracuse—and three grandchildren, Eva Liza Nellis, Theodora and Joseph Nellis Fritcher.

DR. U. D. BILLMEYER.

DIED, at Asheville, N. C., November 24, 1906, in his fifty-second year, U. D. BILLMEYER, D.D.S., of Chattanooga, Tenn.

Dr. Billmeyer was born and spent his youth in Michigan. He was graduated from the State Normal School at Ypsilanti in 1876, and from the College of Dental Surgery of the University of Michigan in 1880. Immediately after graduation he was chosen assistant to the professor of operative dentistry in his alma mater, in which capacity he served with honor and distinction for two years, at which time he resigned to go to a warmer climate in search of health.

In 1883 Dr. Billmeyer settled permanently in Chattanooga, Tenn., and became prominently identified with the business and social interests of that city. His sterling qualities as a gentleman, scholar, and operator soon attracted to him the best and most cultured portion of the community.

Dr. Billmeyer was an unusually skilful operator, and took a leading part in the activities of the dental societies of which he was a member. He was elected president of the Tennessee State Dental Society in 1897, and in 1901 was tendered, and accepted, the chair of professor of operative dentistry in Vanderbilt University, which position he was compelled to resign two years later on account of poor health. Never robust, and fighting from youth that scourge of the human family, tuberculosis, he finally, in 1904, gave up practice, and devoted his time exclusively to a vain search for health.

Dr. Billmeyer loved his profession, and worked always by precept and example to raise it to a higher plane. He was a Knight Templar and a Shriner.

The world has lost in him a valuable citizen, and the dental profession one of its most brilliant and honorable members.

R. M. P.

DR. JAMES OLIVER FLOWER.

DIED, at Pittsburg, Pa., November 8, 1906, after a long illness, Dr. JAMES OLIVER FLOWER, in the sixty-fifth year of his age.

Dr. Flower was born August 17, 1842, in the old Edgeworth Seminary, Sewickley, Pa., which was founded and built by his grandmother, Mrs. Mary P. Oliver. He began the study of dentistry in the office of Dr. Robert Vandervort, one of Pittsburg's oldest dentists.

At the time of the Civil War, Dr. Flower joined the three years' service men, and went to the front. In 1862 he was mustered out on account of illness, and shortly afterward again took up the duties of his calling. After serving an apprenticeship of fourteen years, Dr. Flower became a partner of his preceptor, and subsequently entered upon the career which brought him prominence and professional success.

In 1868 Dr. Flower married Miss S. L. Schinner, who died in 1898. Four children survive him: G. C. Flower, Dr. Will S. Flower, and the Misses Mercedes and Virginia Flower.

DR. RALPH N. BETTS.

DIED, at his home in Sandy Hook, Conn., October 19, 1906, of kidney disease, Dr. RALPH N. BETTS, in the sixty-fifth year of his age.

Dr. Betts had practiced dentistry for many years, but of late, his health having failed, he discontinued his professional work and drifted into commercial pursuits. He was a thorough and conscientious practitioner, and those who knew him realize that in his death they have lost a kind and sympathetic friend. Five sons and one daughter survive him.

SOCIETY NOTES AND ANNOUNCEMENTS.

G. V. BLACK DENTAL CLUB CLINIC.

THE annual Midwinter Clinic of the G. V. Black Dental Club will be held at the Old Capitol building, St. Paul, Minn., on Tuesday and Wednesday, February 26 and 27, 1907.

The clinic committee has prepared the best program possible for it to arrange. The operative clinic and the list of essayists speak for themselves. The list of table clinicians has not been completed. Correspondence with exhibitors leads us to the belief that much which is new will be displayed for those coming from a distance.

Those who are interested in progressive dentistry are most cordially invited to attend our meeting, and take part in the discussion of the clinics and the ideas which will be presented by the essayists.

Special rates are given on all railroads. As there will be other conventions held in St. Paul at the same time, it is suggested that arrangements be made in advance for rooms. The Merchants Hotel and the Ryan Hotel have made a special rate for those attending the meeting. The secretary will gladly reserve rooms for all writing him.

TUESDAY, February 26th, 10 A.M.

Progressive clinic: Gold filling in mesio-occlusal surfaces of upper first molar and upper bicuspids.

1. Dr. A. C. Searl, Owatonna, Minn.
2. Dr. F. S. James, Winona, Minn.
3. Dr. J. W. S. Gallagher, Winona, Minn.

Dr. Wm. Finn, Cedar Rapids, Iowa, will demonstrate the entire method of procedure as followed by these clinicians, using for this purpose a large wooden tooth, clay, etc.

Progressive clinic: Gold filling in mesio-incisal surface of upper canine, lateral and central incisors.

4. Dr. G. N. Beemer, Mason City, Iowa.

5. Dr. W. R. Clack, Clear Lake, Iowa.

6. Dr. F. G. Richardson, Mason City, Iowa.

Dr. F. S. Robinson, Chippewa Falls, Wis., demonstrator.

Progressive clinic: Gold filling in mesial or distal surface of upper canine and lateral and central incisors.

7. Dr. S. Bond, Anoka, Minn.

8. Dr. A. C. Fawcett, Rochester, Minn.

9. Dr. C. H. Robinson, Wabasha, Minn.

Dr. A. M. Lewis, Austin, Minn., demonstrator.

10. Gold filling, occlusal surface of an upper or lower molar, demonstrating use of cohesive and non-cohesive gold. Dr. W. H. K. Moyer, Little Falls, Minn., demonstrator.

11. Porcelain demonstration. Dr. J. O. Wells, Minneapolis, Minn.

12. Amalgam demonstration. Dr. G. D. Moyer, Montevideo, Minn.

Afternoon, 2 P.M.

1st. President's Address. Dr. A. C. Searl.

2d. Report of Clinics.

3d. Essay, "Points of Contact, Their Use and Abuse," by Dr. W. H. K. Moyer.

4th. Essay, "Specific Gravity of Gold Filling," by Dr. K. E. Carlson. (Dr. Carlson will report the results of some experiments which he has made and is still making.)

Evening, 8 P.M.

Illustrated lecture by Dr. G. V. Black, Chicago, Ill.

WEDNESDAY, February 27th, 9 A.M.

The first three clinics are the same as those which will be made Tuesday morning.

Progressive clinic:

1. Dr. C. N. Booth, Cedar Rapids, Iowa.

2. Dr. Wm. Finn, Cedar Rapids, Iowa.

3. Dr. J. V. Conzett, Dubuque, Iowa.

Dr. J. W. S. Gallagher, demonstrator.

Progressive clinic:

4. Dr. J. J. Booth, Marion, Iowa.
 5. Dr. T. F. Cooke, Burlington, Iowa.
 6. Dr. W. G. Crandall, Spencer, Iowa.
- Dr. F. S. James, demonstrator.

Progressive clinic:

7. Dr. S. R. Holden, Duluth, Minn.
8. Dr. A. M. Lewis, Austin, Minn.
9. Dr. F. S. Robinson, Chippewa Falls, Wis.

Dr. W. R. Clack, demonstrator.

10. Amalgam demonstration. Dr. J. B. Pherrin, Central City, Iowa.
11. Porcelain demonstration. Dr. F. S. Yaeger, St. Paul, Minn.
12. Gold inlay. Dr. C. E. Woodbury, Council Bluffs, Iowa.

Afternoon, 2 P.M.

1st. Report of Clinics.

2d. Essay, "The Relation of the Dentist to the Public and to His Patients," by Dr. T. F. Cooke, Mediapolis, Iowa.

3d. Essay, "The Treatment of the Teeth of Children," by Dr. C. N. Johnson, Chicago, Ill.

It is an impossibility to give a list of the table clinicians. A number of men have signified their intention to be with us, and give table demonstrations, which will be of the greatest value to all. This portion of the program has not been completed.

The secretary will be pleased to furnish any information necessary.

R. B. WILSON, *Sec'y*,

Am. Nat. Bank bldg., St. Paul, Minn.

AMERICAN DENTAL SOCIETY OF EUROPE.

The American Dental Society of Europe will hold its next annual meeting in Rome, Italy, on March 29 and 30 and April 1, 1907. A very cordial invitation is extended to members of the profession to be present.

As it is the first meeting of the society in the Eternal City, it is hoped it may be the most enjoyable one in its history.

J. W. GALE, *Hon. Sec'y*,

79 Hohenzollern-Ring, Cologne (Rhine), Ger.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

The Jamestown Dental Convention, to be held under the auspices of the Jamestown Exposition Company, the Southern Branch of the N. D. A., and the Virginia State Dental Association, will convene at Norfolk, Va., September 10 to 12, 1907. The Jamestown Exposition Company have appointed the above named gentlemen as a Committee on Organization, to elect officers in advance of the meeting, to appoint all committees, to finance the meeting, and to bring it to a successful termination.

The Committee on Organization have appointed Dr. Clarence J. Grievess, Baltimore, Md., general chairman of the Clinic Committee and Supervisor of Clinics.

A number of well-known men will assist him on the General Committee. State clinic chairmen have been selected from every state in the Union. The clinics are to be the principal feature of the convention, and it is expected to bring about the largest and most instructive dental clinics ever held. A surgical clinic will also be held under the supervision of Dr. L. M. Cowardin, Richmond, Va. The other members of this committee are J. Y. Crawford, Nashville, Tenn., and A. G. Friedrichs, New Orleans, La. Dr. F. W. Stiff, Richmond, Va., is general chairman of the Membership Committee.

Assistant state chairmen have been appointed from every state in the Union. Already membership fees are being sent in, and

the promise is for the largest gathering of dentists ever held. Only five essays will be read at the convention, one by Prof. W. D. Miller, another by Prof. G. V. Black, and the other three by well-known southern dentists.

Several exhibits of much interest to the profession will be held under the auspices of the convention; among them the dental manufacture exhibit in charge of Dr. John W. Manning, chairman, Norfolk, Va.; a comparative anatomy exhibit, in charge of Dr. W. M. Bebb, chairman, Los Angeles, Cal., which exhibit will consist of three thousand comparative anatomy specimens, and also numerous other collections of interest; a dental historical exhibit, consisting of ancient instruments, operative and prosthetic work, books and photographs, under the chairmanship of Dr. Wm. H. Trueman, Philadelphia, Pa.; the orthodontia exhibit, showing a large collection of models, etc., under the chairmanship of Dr. H. E. Kelsey, Baltimore, Md. The U. S. Naval dental exhibit, showing 3000 charts of the mouths of midshipmen, will be under the chairmanship of Dr. Richard Grady, the U. S. dental surgeon of Annapolis, Md. The exhibit of the U. S. Army Dental Corps, under the chairmanship of Dr. John S. Marshall, San Francisco, Cal., will also show the equipment, method of keeping records, etc., used by the dental corps.*

A full list of the various officers, who are to be elected in advance by the Committee on Organization at their next meeting in February 1907, and of the committees, will appear in due time in the various dental journals. The Committee of Organization is expected to select officers in advance in order that the officers may be prepared for their duties before the actual meeting of the convention.

A cordial invitation is extended to all reputable members of the profession to become members of this convention, and to assist the Committee on Organization in bringing about one of the best, if not the best, dental meeting ever held.

*[Owing to an unfortunate omission in the typewritten copy furnished us by the secretary, the announcement of the convention published in our January issue mixed these two U. S. exhibits, and failed to mention that, as above stated, the naval exhibit will be under the direction of Dr. Richard Grady.—Ed. COSMOS.]

The Exposition itself offers an excellent opportunity for the busy practitioner to take a delightful vacation, see the wonderful historical and naval and military exhibits at the Exposition, and also to participate in this meeting. The membership fee, which is \$5.00, should be sent to Dr. F. W. Stiff, treasurer, 600 East Grace st., Richmond, Va.

For further information address

H. W. CAMPBELL, *Sec'y*,
Suffolk, Va.

A PUBLIC DENTAL LIBRARY IN THE City of Columbus, Ohio.

THE Trustees of the new Columbus Carnegie Library Building, a handsome structure costing \$250,000, have set apart a room 40 by 60 feet for the exclusive use of a Dental and Medical Library.

Columbus being centrally located and of easy access to the majority of the dentists in the state, should be the home of what the dental profession has hitherto been without: a library complete in all the literature of the profession, making it invaluable for research and reference.

The local dentists have organized a Dental Library Association for the express purpose of bringing this matter to a successful issue, and the work thus far accomplished far exceeds our expectations. The Columbus dentists alone have donated \$500 in cash and a number of books and magazines.

To make this library complete in embracing all known works pertaining to our specialty and complete files of all the journals published, we desire the co-operation of every dentist in the state. Any old and rare works, copies of old journals, etc., will be gratefully received, inscribed with the name of the donor, and recorded to his credit in the library catalog. Please communicate with us concerning any literature you may have that you can donate to this cause, giving titles and authors of books; names and dates of journals, etc. In case of duplication they will be valuable for exchange with other libraries.

W. H. TODD, *Pres.*,
190 S. High st.
EDWARD C. MILLS, *Sec'y*,
10 Y. M. C. A. bldg.

NATIONAL DENTAL ASSOCIATION.

COMMITTEE ON HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct ap-

peal by circulars, etc., the present total number of subscriptions received by the treasurer is 400, leaving 300 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.

WM. H. TRUEMAN, Philadelphia.

GORDON WHITE, Nashville, Tenn.

H. L. AMBLER, Cleveland, Ohio.

JAS. McMANUS, Hartford, Conn.

J. Y. CRAWFORD, Nashville, Tenn.

A. H. FULLER, St. Louis, Mo.

S. A. FREEMAN, Buffalo, N. Y.

W. E. BOARDMAN, Boston, Mass.

CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.

CHAS. McMANUS, *Ch'man*, Hartford, Conn.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

NOTICE TO THE ALUMNI.

ANY alumnus not having received a copy of the souvenir number of the *Pennsylvania Dental Times*, giving the proceedings of the golden anniversary of the Pennsylvania College of Dental Surgery, may secure the same by sending his name and address to

WILBUR F. LITCH, *Dean*,

Eleventh & Clinton sts., Philadelphia, Pa.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the European plan. Any room in the hotel is capable of accommodating two people. All the rooms have telephone connection, and hot and cold water. Railroad rates will be given later.

The Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,
29 Fulton st., Newark, N. J.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-third annual convention of the Connecticut State Dental Association will be held at New London, Conn., April 16 and 17, 1907.

An excellent program is assured.

EDWARD S. ROSENBLUTH, *Sec'y*,
1051 Main st., Bridgeport, Conn.

MONTANA STATE DENTAL SOCIETY.

A MEETING of the Montana State Dental Society will be held in Helena, April 12 and 13, 1907.

W. E. TREBISE, *Sec'y*,
Helena, Mont.

ONTARIO DENTAL SOCIETY.

THE eighteenth annual meeting of the Ontario Dental Society will be held in the College Building, Toronto, Ont., February 25, 26, and 27, 1907.

A. E. WEBSTER, *Sec'y Program Committee*,
Toronto, Ont.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association will hold its annual meeting at Eureka Springs, Ark., May 29, 30, and 31, 1907.

HENRY P. HOPKINS, *Sec'y-Treas.*,
Argenta, Ark.

DETROIT DENTAL SOCIETY.

CLINIC AND BANQUET.

THE twenty-fifth anniversary of the founding of the Detroit Dental Society will be celebrated February 16, 1907.

A splendid program has been arranged, including a clinic, banquet, and a lecture by Dr. C. N. Johnson, the guest of honor, on a subject in which all progressive men are interested—cavity preparation for inlays. A very cordial invitation is extended to all reputable practitioners to attend this meeting.

For any further information apply to

GEORGE F. BURKE, *Sec'y*,
315 Stevens bldg., Detroit, Mich.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Dental Society of the State of New York will be held in Albany, May 10 and 11, 1907.

Essays will be presented by the following members of the profession: W. D. Miller, Berlin; A. H. Peck, Chicago; Charles McManus, Hartford; Clarence J. Grieves, Baltimore; G. V. I. Brown, Milwaukee; L. C. F. Hugo, Washington; Nelson T. Shields, New York; I. C. Curtis, Fulton; S. L. Goldsmith, New York (Report of Correspondent); E. Howard Babcock, Brooklyn (Report of Committee on Practice); Emanuel Muntz, Buf-

falo (Report of Committee on Scientific Research).

A full list of clinics is being arranged, and a complete program will be announced later.

W. A. WHITE, *President*,
Phelps, N. Y.
CHAS. S. BUTLER, *Sec'y*,
Buffalo, N. Y.

KENTUCKY STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21, and 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession.

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

VERMONT STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., May 15, 16, and 17, 1907.

The society has in the past held most successful meetings, and we have every reason to expect that this will surpass any previous one, as a very interesting program has been prepared by the committee, and will be mailed in due time. Vermont has the largest per cent. of membership in its state society of any state in New England, and we hope to see every dentist in the state who is eligible a member.

THOMAS MOUND, *Sec'y*,
Rutland, Vt.

SAN FRANCISCO DENTAL SOCIETY.

At the regular meeting of the San Francisco Dental Society the following-named officers were elected for the ensuing year: H. A. Frederick, president; L. V. Levinger, vice-president; L. C. Heller, recording secretary; F. J. Lane, financial secretary; W. A. L. Knowles, treasurer; M. A. Greenlaw, librarian.

L. C. HELLER, *Sec'y*,
San Francisco, Cal.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE tenth annual session of the Southern California Dental Association will be held in Los Angeles, May 6, 7, and 8, 1907, at the same time that the Imperial Council of Mystic Shrine meets here, and all members of the dental profession contemplating visiting southern California at that time will confer a favor upon the association by notifying

CHAS. M. BENBROOK, *Sec'y*,
455 S. Broadway, Los Angeles, Cal.

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

CONSOLIDATION OF THE FRATERNAL DENTAL SOCIETY AND THE SOCIETY OF DENTAL SCIENCE OF ST. LOUIS.

At a joint meeting of the Fraternal Dental Society and the Society of Dental Science of St. Louis, held December 18, 1906, a consolidation of the two societies was effected, the consolidated body to be known in the future as THE ST. LOUIS SOCIETY OF DENTAL SCIENCE.

The officers and committees for the ensuing year are D. O. M. Le Cron, president; Richard Summa, vice-president; Clarence O. Simpson, secretary; W. E. Brown, treasurer. Executive Committee—W. L. Whipple, E. E. Haverstick, and Herman F. Cassel. Advisory Council—George A. Bowman, A. H. Fuller, Adam Flickinger, Wm. Conrad, Burton Lee Thorpe, Edward H. Angle, and E. P. Dameron.

CLARENCE O. SIMPSON, *Sec'y*,
457 Century bldg., St. Louis.

IOWA BOARD OF DENTAL EXAMINERS.

THE Iowa State Board of Dental Examiners will hold their next meeting for examination at Iowa City, February 6, 7, 8, and 9, 1907. Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination.

Address all communications to
E. D. BROWER, *Sec'y*, Le Mars, Iowa.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry will be held in Boston, March 6, 7, and 8, 1907, for the examination of candidates. Application blanks and further information may be obtained from

G. E. MITCHELL, *Sec'y*,
Haverhill, Mass.

MINNESOTA BOARD OF DEN- TAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold its next regular meeting at Minneapolis, in the Medical Building of the State University, on April 2, 3, and 4, 1907. All applications must be in the secretary's hands by 11 o'clock of April 2nd. Candidates will be furnished all necessary blanks and such other information as is necessary, upon application to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, Ark., May 27 and 28, 1907.

A. T. McMILLIN, *Sec'y*,
Little Rock, Ark.

BOARD OF DENTAL EXAMI- NERS OF CALIFORNIA.

THE Board of Dental Examiners of California held its last meeting in Los Angeles in December 1906, at which time there were forty-seven applicants for examination, of whom twenty-four were successful.

The following officers were elected for the ensuing year: Garrett Newkirk, M.D., Pasadena, president; C. A. Herrick, D.D.S., Jackson, secretary; Joseph Loran Pease, D.D.S., Oakland, treasurer.

The next examination will be held in Los Angeles beginning June 10, and in San Francisco beginning June 17, 1907.

C. A. HERRICK, *Sec'y*,
Jackson, Cal.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING DECEMBER 1906.

December 4.

No. 837,422, to JULIUS ROEMER. Thread-cutting device.

December 11.

No. 838,027, to FREDERICK L. HUNT. Tool for handling artificial teeth.

No. 838,296, to HARRISON D. BEST. Dental work.

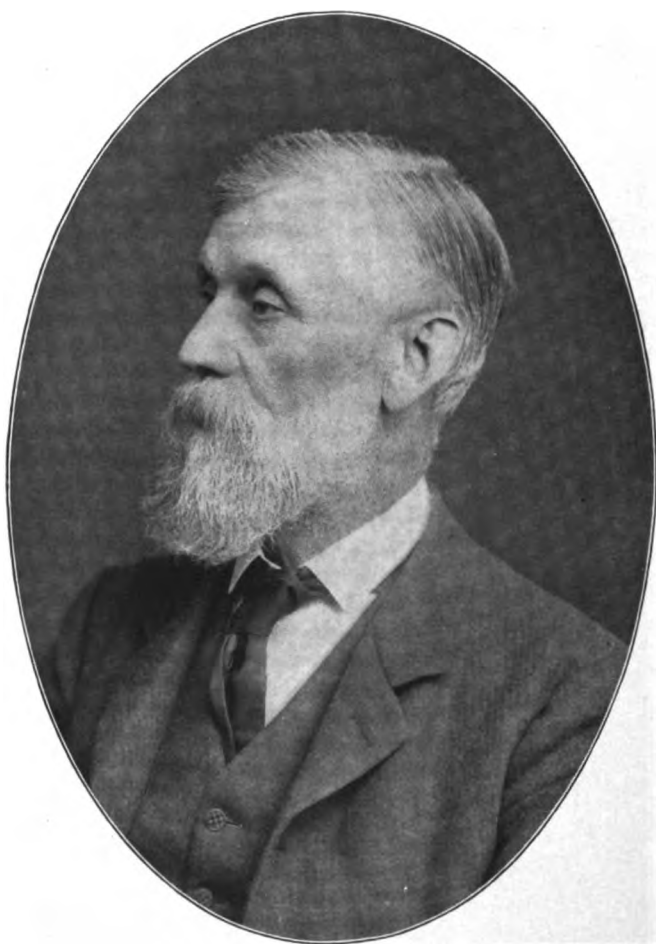
No. 838,299, to ARTHUR W. BROWNE. Head-rest.

No. 838,415, to JOHN H. JACKSON. Artificial tooth.

December 18.

No. 838,648, to OLIVER T. ROBERTSON. Combination hand mouth-mirror and chip-blower and flushing and spraying device.

No. 838,849, to CHARLES A. DAVIS. Porcelain and metallic crown.



SIR MICHAEL FOSTER.
K.C.B., F.R.S., D.C.L., D.Sc., LL.D.

THE DENTAL COSMOS.

VOL. XLIX.

MARCH 1907.

No. 3.

ORIGINAL COMMUNICATIONS.

EXPERIMENTS AND OBSERVATIONS ON THE WASTING OF TOOTH TISSUE VARIOUSLY DESIGNATED AS EROSION, ABRASION, CHEMICAL ABRASION, DENUDATION, ETC.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Ger.

(Continued from page 124.)

(III.)

BEFORE taking up the discussion at the point where it was broken off at page 124 of the February issue of the Cosmos, I wish to correct an error of omission by adding the mucic acid theory of Dr. Cook to the list given on page 2. I beg further to call attention to the case of wasting shown in Fig. 31, where the teeth have been shortened and an open bite produced by the action of the brush and powder. The patient is a man thirty-eight years of age who has always been in perfect health and shows no symptoms of any general malcondition. He *claims* that he brushes his teeth ten minutes at a time twice daily, and uses a French preparation containing a

fair amount of grit. Making all due allowance for exaggeration we may safely estimate the total amount of time spent daily as at least four minutes, which is quite sufficient. That which stamps the case as undoubted wasting is the pronounced wearing of the gold fillings. The filling in *a* is very much rounded off and on a lower level than the enamel. In *e* and *f* both fillings are worn down until they are as thin as paper, and in *f* particularly the gold is worn quite through at one point near the center of the filling, exposing the dentin on the floor of the cavity. A very similar condition can be produced artificially, as in the case shown in Fig. 20 (page 112), where the teeth

were very much shortened by brushing for eighteen hours with a well-known English tooth-paste. In another experiment the teeth of both the upper and lower

FIG. 31.



Shortening of the teeth and open bite produced by immoderate use of brush and powder.

jaws were brushed at the same time, imitating as nearly as possible the manner of brushing practiced in the case shown in Fig. 31, fillings of porcelain, phosphate cement, silicate cement and gold having been inserted. Brushing for thirty-five hours with pumice not only produced wedge-shaped defects in all of the teeth to the first molars, but shortened all of the incisors so as to produce a distinctly open bite, and at the same time removed the greater part of the enamel from the labial surfaces. The porcelain filling withstood the wear much better than the enamel, the cements less well.

Experiments relating to the action of carbonic acid upon the teeth were reported upon in the February issue of this journal. In continuation of the same I found that when carbonic acid was made to bubble through a shallow layer of water from a glass tube drawn out to a fine point, and to impinge upon the surface of a tooth placed one-half inch above

the surface of the water, a very marked action upon the dentin as well as the enamel was observed in four days. (Fig. 32.) The tooth was ground down on one side before the experiment, in order to expose the dentin, and kept moist by a strip of paper hung across it so that both ends dipped into the water. The result is significant with reference to the question whether the carbonic acid exhaled may possibly in the course of years have a slight effect upon the surface of the teeth against which it impinges in mouth-breathing. As already stated, it is but a thought thrown out, and I am not prepared at this writing to say that it is of any particular importance, though it does not seem unreasonable to suppose that, *in conjunction with mechanical action*, as in the case of wasting of the lingual surface of the upper incisors reported in the preceding issue of this journal, a certain effect might be brought about.

We come now to the question: *What are the acids or acid bodies which may be concerned in chemico-abrasion?*

We have the following sources of acids to deal with:

- (1) Acids poured into the mouth with the saliva in certain diseased conditions of the body.
- (2) Acid substances secreted by the glands of the mucous membrane.
- (3) Acids produced by the fermentation of foods.
- (4) Acids produced by the fermentation of mucin.
- (5) Acids taken into the mouth with food or medicine.
- (6) Acid vapors.

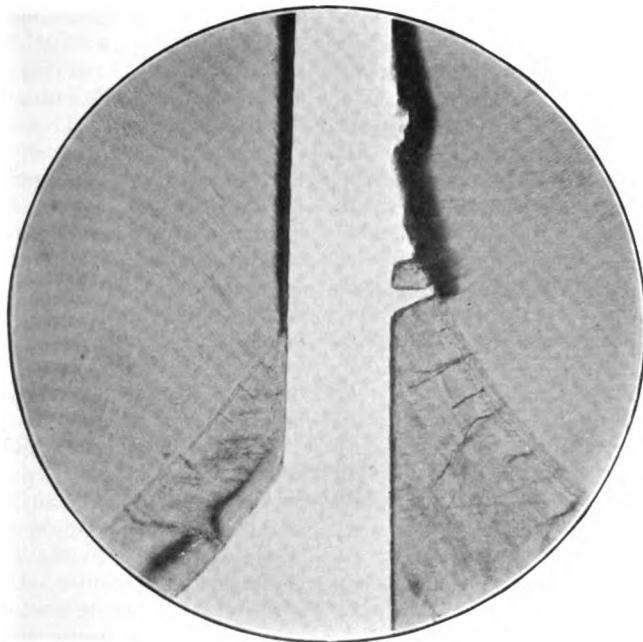
(1) It is improbable that any general acid condition of the secretion of the salivary glands can under ordinary circumstances be an important factor in the production of wasting of the teeth. Any such condition would manifest its decalcifying action on all of the teeth, and in particular on those surfaces most exposed to it, that is, on the buccal surfaces of the upper molars and the lingual surfaces of the lower incisors. But these are

places where we very seldom see wasting.

The fact that different authors have come to diametrically opposite conclusions regarding the reaction of the saliva would also seem to indicate that this cannot be an important element in ordinary cases of wasting. Personally I am de-

ing on a bit of non-medicated cotton a few ccm. of saliva may easily be gathered in a clean bottle and the reaction taken. It must of course not be forgotten that the reaction of the saliva varies at different times of the day, and that the alkalinity is most pronounced immediately after eating and is least so when the

FIG. 32.



Decalcifying action of bubbles of carbonic acid on dentin and enamel.

cidedly of the opinion that wasting of the teeth is not necessarily accompanied by an acid reaction of the saliva. In 52 cases in which the reaction of the saliva was taken I found it alkaline in 40, neutral or amphoteric in 10, and acid in 2. I fancy that a great many make a mistake in testing the saliva by simply applying a strip of blue litmus paper to the mucous membrane of the mouth, which nearly always shows an acid reaction. Before making a test of the saliva the mouth should be thoroughly cleansed, or at least rinsed with pure water to remove all particles of food, mucus, and acids produced by fermentation; then, by chew-

stomach is empty. The majority of my tests were made in the forenoon about 11 o'clock; none of them very soon after eating.

In my own case the difference in the reaction of the saliva before and after eating might be called astonishing, as may be seen from the accompanying illustration. It is, however, not always as marked as in this case.

A similar oscillation in the reaction of the urine is said to exist, and it would be well worth while to examine the buccal mucus with reference to the same matter. The few tests which I have been able to make were not conclusive.

Various cases have been reported in dental journals and in text-books on dentistry, under the title "erosion," in which after some severe illness (typhus, gastric disturbance, etc.) a general decalcification of the teeth with wasting of the enamel was observed. These are rare cases which the dentist may meet with once or twice in his lifetime, or not at all. They are due to an intense action of an acid accompanied by the friction of the tooth-brush, and we find the wasting usually associated with more or less softening of the dentin, especially at the necks, or even on the crowns of the teeth.

In this connection we must not forget that a general acid condition in the mouth may lead to a wearing down of the teeth on the morsal surface, as the direct force of mastication is not only sufficient to wear away the disintegrated enamel but also the dentin, decalcified as well as non-decalcified. I have called attention to the fact that while the tooth-brush attacks decalcified dentin less readily than non-decalcified, a hard object such as a wire brush has just the opposite action in that it *tears* away the decalcified tissue more readily. It is well to bear this fact in mind—as well as the inference to be drawn from it, that even softened dentin on the grinding surface may be worn away by the force of mastication acting directly upon it. We see evidence of this in the wearing of the dentin which takes place in the spontaneous healing of caries, although we are not able as yet to say whether changes may not have taken place in the carious dentin which makes it more susceptible to wear.

(2) One of the most difficult and intricate problems associated with the question of wasting of the teeth is the agency of certain acid substances which are said to be produced by the labial glands under certain conditions, and undoubtedly we meet with an acid reaction here much more commonly than in the saliva.

In testing the mucus there are three things to be taken into consideration: (1) The reaction of the fresh mucus; (2) The reaction possibly produced by the fermentation of the mucus; (3) The

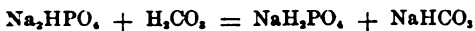
modification of the reaction by the fermentation of small particles of food adhering to the mucous membrane. My own mucus, which I have tested some hundreds of times, has an acid reaction at all times of the day. It seems to be capable of undergoing fermentation by which the acid reaction is increased (see DENTAL COSMOS, 1905, p. 1301). I consequently find the reaction strongest in the morning, before rinsing the mouth, and a few hours after meals at which I have eaten soft carbohydrates. I suspect accordingly that my mucus contains at different times different acids, and in different quantities. The reaction is furthermore stronger in the upper than in the lower lip, and *about equal on the lip and on the gums*. In spite of the comparatively strong acid reaction of my own mucus I have been unable to detect any action on the enamel, the only result being a softening of the dentin at the necks of the teeth, and brushing my teeth twice daily *without powder* seems to have no effect on the decalcified dentin and no wasting is produced.

The reaction of the mucus of the upper as well as of the lower lip should be taken by lifting up the lip and inserting a strip of blue litmus paper on one side of the jaw and the red on the other, leaving it there until it becomes saturated. To determine whether the acid comes from the lip or from the gums, insert two pieces of litmus paper separated by any impermeable substance which does not affect the reaction. The reaction should be taken before rinsing the mouth, as in this way only do we obtain true information as to the condition present at the time. If we wish to obtain the reaction of the fresh mucus alone we must of course thoroughly free the parts from all accumulations before making the test. In 52 cases where I made the test after the patient had simply rinsed the mouth I found the mucus alkaline in 8, amphoteric or neutral in 18, and acid in 26. We must not, however, overlook the fact that the mere power of the mucus or saliva to redden blue litmus paper does not necessarily indicate a particularly deleterious action of that mucus upon the

teeth. This depends altogether upon the nature of the acid in the mucus, and as to this our knowledge is at present incomplete. In 26 cases of chronic rheumatism I found 23 with acid mucus. My own mucus is as acid as any I ever met with; and so, too, we find as a rule that the mucus has an acid reaction quite independently of the presence or non-presence of wasting. I have never yet met with a case in which a piece of blue litmus paper inserted between the upper lip and the alveolar process on rising in the morning did not become reddened, and in 25 cases tested at the dental clinic by Mr. Brusen-dorf between one and two o'clock in the afternoon, the mouth not having been rinsed, the litmus was invariably red-dened.

The acidity of the fresh mucus not contaminated by acids of fermentation or otherwise may be due to different causes. It is more particularly the acid sodium phosphate which is looked upon by many as the substance which gives the mucus its acidity and which is respon-sible for chemico-abrasion.

Brubaker (*International Dental Jour-nal*, 1894, p. 742) proposes an ingeni-ous theory to account for the supposed presence of acid phosphates in the buccal mucus. According to him the di-sodium phosphate present in it is converted by carbonic acid into the acid sodium phos-phate and sodium bicarbonate:



The acid sodium phosphate (NaH_2PO_4) brings about a disintegration of the en-amel.

It should be pointed out, however, that NaH_2PO_4 and NaHCO_3 , mixed in the proportions demanded by the formula are rapidly decomposed, with evolution of CO_2 , and a solution results which has no action on either dentin or enamel. On the other hand, there is theoretically no reason for rejecting the suggestion that the acid phosphate alone may be elimi-nated by the glands and the bicarbonate returned to the blood—as has been em-phasized, I believe, by Kirk.

Likewise, Burchard ("Dental Pathol-ogy and Therapeutics"), Truman, Kirk,

and others incline to the view that the acid which may be concerned in wasting of the teeth is secreted by the mucous glands. Under normal conditions the secretion of these glands is often said to have an alkaline reaction, but in the case of certain derangements the secretion be-comes acid owing to the presence of acid sodium phosphate. The acid calcium phosphate has also been detected in the oral secretions under morbid conditions.

The assumption, however, that the secretions of the labial glands have an alkaline reaction under normal conditions seems to rest upon some error of obser-vation. The mucous membrane of the whole mouth will nearly always be found to have an acid reaction at all times of the day, as already pointed out above, and that, too, quite independently of the presence or absence of wasting. This reaction is due in part to processes of fer-mentation going on on the surface, but even after thoroughly rinsing the mouth we find as a rule that the mucous secre-tion reddens blue litmus paper.

Whether this acidity normally present is really produced by acid sodium phos-phate, in whole or in part, we are not able to decide with certainty at pres-ent. According to Kirk it is particularly in morbid conditions that we have to ex-pect the acid phosphates.

With my present understanding of the subject I have some difficulty in recog-nizing the acid sodium phosphate as a potent agent in the process of chemico-abrasion, because of its comparatively slight action upon the hard tissues of the tooth.

A 1 per cent. solution of the acid so-dium phosphate, obtained from the well-known firm of Kahlbaum, Berlin, acting upon a section of a tooth for six weeks at the temperature of the body, did not produce the slightest visible effect on the dentin or the enamel. Likewise a 2 per cent. solution in seven weeks produced so slight an effect even upon the cut sur-face of the enamel that it could only be determined with a magnifying glass.

Also a 1 per cent. solution acting for three months left the surface perfectly smooth and bright. Again, a 1 per cent.

solution dropping from 15-20 hours a day for 10 days upon the ground surface of a tooth showed no effect whatever on either the dentin or enamel.

Finally, a sound tooth kept for over a year in a 5 per cent. solution of acid sodium phosphate was only superficially disintegrated on the external surface.

The acid calcium phosphate has a much stronger action in the same concentration, and for this reason as well as for others to be given later, I should be inclined, of the two bodies, to attribute the greater importance to this one. Attempts to collect the mucus in sufficient quantity to admit of a reliable analysis have up to the present time but imperfectly succeeded, and we shall probably have to depend upon the methods introduced by Michaels and Kirk for the acquisition of a more definite knowledge of the chemical character of the oral mucus under normal as well as under pathological conditions.

A second cause of the acid reaction of the buccal mucus is to be found in *mucin*.

Mucin, an important constituent of the secretion of the mucous glands, is an acid occurring in combination with sodium or calcium or both. It is possible that there may also be free mucin present in the secretion. Its affinity for calcium salts is so slight, however, that it is doubtful whether even when present it has the qualities capable of attacking the enamel. It can hardly, therefore, be looked upon as an agent of importance in the production of wasting, to say nothing of the fact that clinical observations have taught us that wasting of the teeth is not in the majority of cases accompanied by the production of large quantities of mucin.

In my investigations I have found viscosity of the saliva in only 45 per cent. of the cases examined.

(3) Processes of fermentation which take place in particles of food retained between the lip and the upper front teeth lead to disintegration of the enamel and to caries. If the brush and powder were only used vigorously enough to brush away the enamel as fast as it is disinte-

grated, we should in all such cases get wasting instead of caries, but this same brushing would free the surface from food, and for the time being at least stop the fermentation. We can readily understand, however, how a person who brushes his teeth only in the morning, and leaves them subjected to the action of fermenting particles of food over night, might bring about a wasting of the enamel in this way. Likewise, if one whose enamel has become disintegrated on the labial surface, as a result of lack of care of the teeth, should take to brushing with powder, he may wear away the disintegrated tissue and bring about the appearances characteristic of wasting. I have met with a few cases which admitted of an explanation on this basis.

(4) With regard to the very important question as to whether mucin, or the carbohydrate (chitosamin) which forms 25 per cent. of it, is capable of undergoing an acid fermentation, I refer the reader to my experiments reported in the *DENTAL COSMOS* for 1905, vol. xlvii, p. 1301, no further investigations in this line having been since made.

(5) It is a well-known fact that a grape or orange cure may have a most deleterious effect upon the teeth, and Schlenker ("Untersuchungen über das Wesen der Zahnverderbnis," 1882) pointed out that it may produce a condition apparently identical with wasting, provided the teeth are regularly brushed. Two cases came under my notice recently that are sufficiently interesting to merit closer study.

For the first case I am indebted to Dr. Watson of Berlin. An Italian lady, age thirty-one, states that she is in perfect health with the exception of chronic obstipation, and uses the brush moderately with a mild tooth-powder. Her teeth are affected in an unusual fashion, inasmuch as the labial surfaces show peculiar cavities closely approaching a half-circle in shape with the base at the neck of the tooth. These cavities have fairly smooth borders and bottoms, and look

almost as though they had been prepared for porcelain inlays except that they are too shallow. The lingual surfaces of the teeth are completely denuded of their enamel and present a fairly smooth though not shining surface. Similar effects are beginning to appear on the canines and bicuspid. The molars and to a certain extent the bicuspid in the upper jaw are considerably worn down and present cup-shaped surfaces. In the lower jaw the teeth show no defects except a slight wearing down of the incisors and canines.

Examination of the saliva gave the following results: Quantity normal, slimy, strongly alkaline, ammonia weak, chlorids normal, potassium sulfocyanid weak, phosphates under normal, alkaline salts abundant, and among others the basic potassium phosphate. The patient is a vegetarian, eats two or three oranges four times a day, sucking or squeezing the juice out of the segments by pressing them against the upper teeth with the tongue. During the grape season she lives almost entirely on grapes; when these are not to be had, apples, figs, strawberries, etc., take their place.

The other case referred to is similar to that just described. All of the upper front teeth present slight defects (loss of substance) of the enamel, involving about one-third of the labial surface toward the neck. The defects have hard surfaces and are present in the lower teeth in a slighter degree. In this case, too, the patient suffers from indigestion, but shows no trace of gout or rheumatism. He eats six oranges every evening, and occasionally considerable quantities of grapes. Saliva and mucus are very slightly acid. He brushes once a day with powder.

In both these cases I think that there is little room for doubt that the food is responsible in a great measure for the characteristic defects of the teeth.

I have recently met with two cases in which there was *softening of the dentin at the neck of the upper incisors combined with polished defects on the surface of the enamel*. In the one case a neuras-

thenic of forty-five years ate excessive quantities of fruit; there was wasting to a marked extent on both the upper and the lower teeth. At the necks of all the upper incisors the dentin was softened to a depth of about $\frac{1}{2}$ to $\frac{3}{4}$ mm. and showed no wearing away; at the same time there was an evident loss of substance of the enamel, and on the left central a smooth defect about 2 mm. below the cervical margin. In a second similar case of wasting I found softening at the neck of the upper left central where the gums had receded, and a sort of pocket was formed in which particles of food were retained. In both cases the teeth were brushed vigorously, in one with a powder containing about 5 per cent. of pumice.

(6) The action of vapors given off from powerful acids in the production of wasting has been discussed above.

Dr. Cook (*Dental Review*, May 1906, p. 461) following up a suggestion of Mr. McGuigan, comes to the conclusion that mucic acid is an important element in wasting. This acid is presumed to be produced by a complicated series of changes from lactose, and its production is said to be governed at least by enzymes. Or mucin may give rise to mucic acid. It remains to be seen, however, whether mucic acid really occurs in the mouth. By the aid of mucic acid in connection with the mechanical action of a stiff brush, Dr. Cook succeeded in producing wedge-shaped defects at the neck of the tooth, but this experiment hardly proves that mucic acid is really a factor in wasting, especially at the neck of the tooth. We shall await with much interest further reports from Dr. Cook. The results which I personally obtained with mucic acid were similar to those produced by weak solutions of oxalic, tartaric, etc., acids. All of these are similar in their action in that they attack the enamel more vigorously than the dentin, and do not cause the marked softening produced by hydrochloric, lactic, acetic, and other acids. The first two form insoluble compounds with calcium salts, and I suspect that such is the case with mucic acid also.

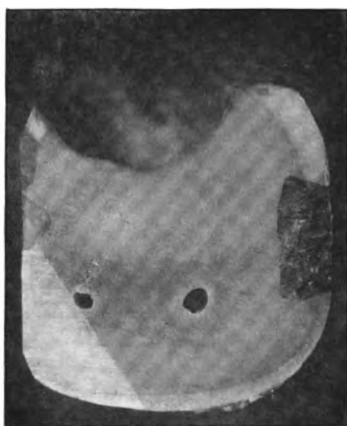
DIAGNOSTIC VALUE OF FILLINGS.

(a) *Gold and amalgam.*

I have already dealt with the comparative rapidity with which the tissues of the teeth and filling materials are worn down, and have referred to the fact that under the action of acids in conjunction with friction we obtain very different results. This is illustrated by Figs. 33-35.

In Fig. 33 we see the wearing down and slight cupping of a gold filling on

FIG. 33.



Cupping of gold filling on external surface of enamel produced by friction of brush and powder.

the buccal surface of a molar brushed for two hours with pumice.

Fig. 34 is a section of a tooth filled with amalgam and subjected to the action of a 1 per cent. solution of lactic acid, brushed twice daily with chalk for six days. The filling stands here far above the surface of the enamel.

Fig. 35 is a tooth filled with gold and subjected to action of oxalic acid 1:1000 for four weeks, brushed twice daily with chalk. Here again the filling stands higher than the surface of the enamel.

Similar results were obtained with hydrochloric, lactic, and phosphoric acids, 1:1000.

In all cases where we find a gold or amalgam filling standing out above the

enamel surface, as in Figs. 34 and 35, we may be sure that there has been strong acid action upon the enamel; and when, on the other hand, a gold filling is cupped and its surface lies lower than that of the enamel, the acid is very weak or altogether wanting. Naturally a badly condensed gold filling wears faster than one properly made. A case illustrating the above fact was reported by Mr. Hern at a special meeting of the Odontological Society of Great Britain. A patient had been ordered nitro-hydrochloric acid for some acute trouble. He went on taking it for six months. Mr. Hern found all of the gold fillings standing out above the surface of the enamel.

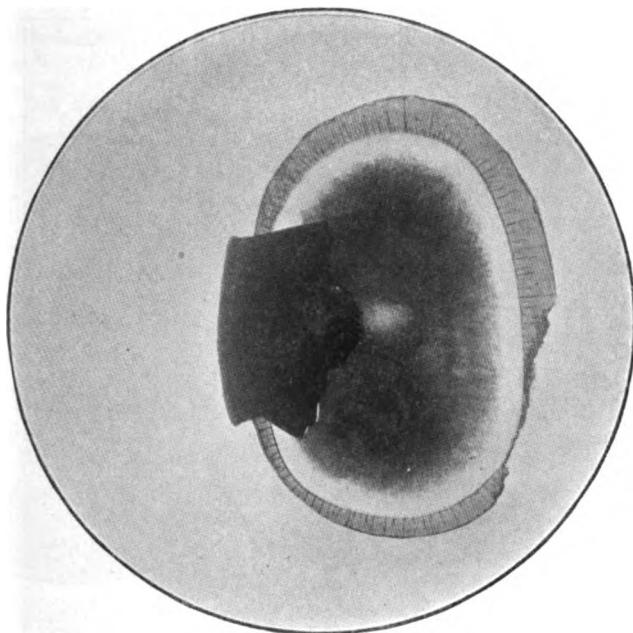
The above criterion may be applied, however, only in case of sound enamel, and where the brush acts at right angles to the direction of the enamel prisms. When the brush strikes the sides of the prisms they wear down as fast as and usually faster than gold without the accompanying action of an acid. This fact, too, is illustrated by Figs. 36 and 37.

The way in which recurrent wasting appears around gold fillings is illustrated by Figs. 38 and 39. A bicuspid was filled with gold on the buccal surface, as seen in the figures. Fig. 38 shows the appearance of the tooth and filling after it had been brushed for five hours with pumice. The enamel and gold wore down with about the same rapidity, the gold a little bit faster, until toward the end of the fourth hour the enamel had become much thinned down and that part lying between the filling and the cervical border was entirely brushed away. The enamel being gone, a deep groove was soon cut into the dentin on the cervical wall of the gold filling, with two horns which extended gradually along the sides of the filling until in six and one-half hours they met in the median line (Fig. 39), thus isolating the filling completely and leaving it projecting considerably above the surface of the dentin.

(b) *Cement fillings.*

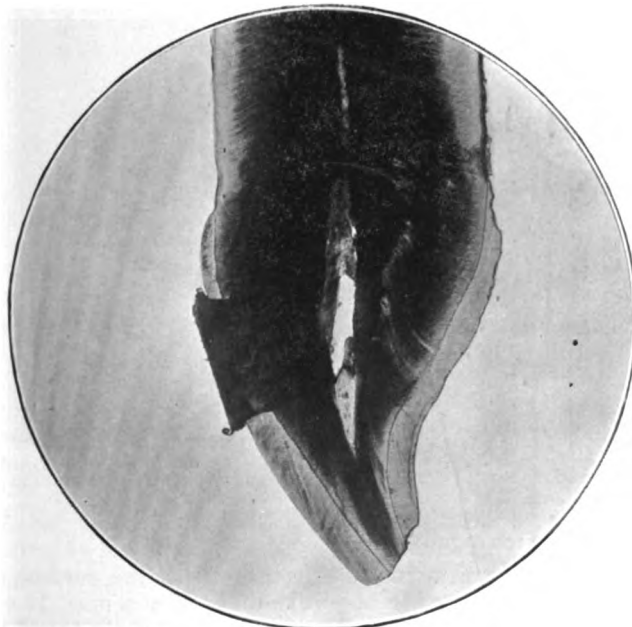
The condition of cement fillings in cavities produced by wasting may fur-

FIG. 34.



Action of friction in conjunction with lactic acid 1 per cent. on filled tooth.
(Compare with Fig. 31.)

FIG. 35.

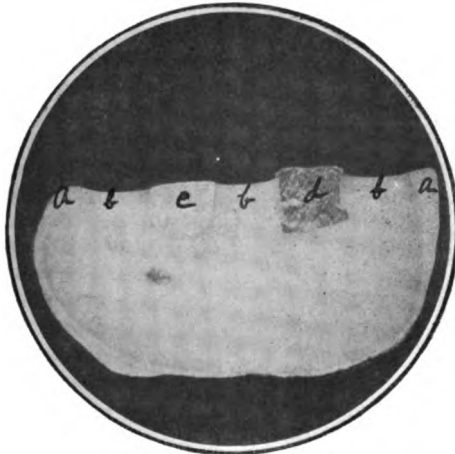


Action of oxalic acid 1:1000 in conjunction with friction on tooth with gold filling.

nish a valuable indication as to the cause of the process. This fact is illustrated by the case of a woman in the forties,

a small filling of Ascher's cement, one of the new silicate cements, near the neck of the tooth, and that filling is now pro-

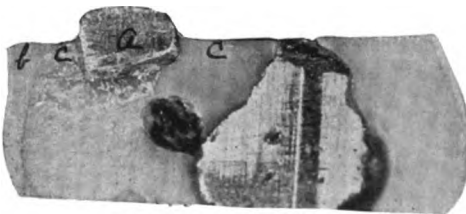
FIG. 36.



Effect of brush and powder acting parallel to direction of enamel prisms: (a) enamel, (b) dentin, (c) amalgam, (d) gold.

whose upper centrals in particular had been suffering from progressive wasting for many years, laying the dentin bare on the labial surface. Three years ago

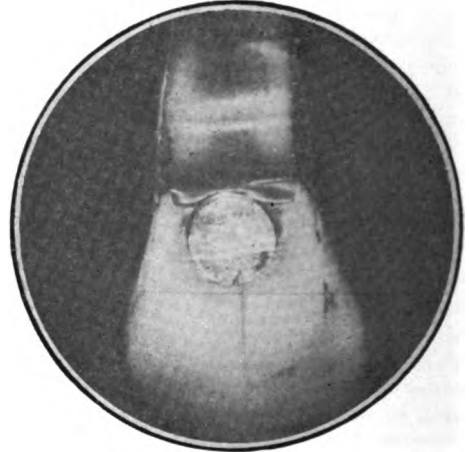
FIG. 37.



Excessive action of brush and powder on tooth tissue compared with gold filling: (a) filling, (b) enamel, (c) dentin. They were on exactly the same level at the beginning.

I prescribed for her a soft brush and a powder consisting of precipitated calcium carbonate. Notwithstanding this, she as well as the dentist now treating her affirms that the wasting is still continuing. Some two years ago her dentist had made

FIG. 38.



Secondary wasting (abrasion) produced by brush and pumice in four hours.

FIG. 39.



Secondary wasting (abrasion) after six and one-half hours' brushing.

jecting above the surface of the dentin like the head of a pin. It was clear to me that whatever the cause of this continued wasting, it attacked the dentin more rap-

idly than it did Ascher's cement. I accordingly ground away the enamel from the labial surfaces of a number of upper incisors and bored little holes near the necks, filling them with Ascher's cement. On brushing these teeth *with the same brush and powder used by the patient*, the dentin wore down, leaving the filling projecting as described above in one and one-half hours, so that if the patient brushed her teeth but for five or ten seconds a day only she could well have produced the wasting observed in two or three years. Still the question was not disposed of as to whether, after all, some chemical substance may not be active in the process. I accordingly subjected teeth treated as described to dilute solutions of oxalic, tartaric, and mucic acids, to acid sodium phosphate and acid calcium phosphate, also to alkaline solutions: caustic potash and carbonate of potassium. The action of the oxalic acid was particularly remarkable inasmuch as the filling became so disintegrated in twenty-four hours that on passing over the surface with the brush it disappeared totally. Tartaric acid, as well as grape-juice and mucic acid, acted similarly though not so rapidly. In all, however, there was a pronounced solution and wasting of the filling inside of a week. Likewise oxalic acid 1:1000 caused rapid disintegration of the filling. Further, lemon-juice 1 to 4 water, apple-juice, white wine, acid calcium phosphate 1 per cent., formic acid 1 per cent., all caused cupping of filling, likewise stronger solutions of acid sodium phosphate; a 1 to 2 per cent. solution of this salt had but slight effect one way or the other. At the close of the experiment the fillings stood higher than the surfaces of the dentin, but the difference was not so pronounced as where the brush was used alone. Most of the alkalis produced no effect so far as could be determined. These results leave no room for doubt that it is a case of abrasion simply, which is not surprising after all, since we have already seen that precipitated chalk may attack the dentin vigorously.

I would advise the prosecution of similar experiments wherever the opportunity

presents itself, as the results obtained are certainly very instructive and suggestive.

The behavior of tartar in wasting is likewise significant, and may sometimes be made use of as a means of diagnosis. The dark brown or greenish variety of tartar is very tough and resists the action of the brush more stubbornly even than does dentin, but the softer yellowish tartar brushes away more rapidly, and we find that if a tooth whose root is covered with tartar be brushed with powder the tartar will be rounded off on the edges. Where two teeth stand very close together and the space between them is filled out with tartar, it wears away nearly on a level with the dentin, showing perhaps but slight cupping. If we act upon the tooth with a weak acid in the manner usually adopted in my experiments, we shall find the tartar receding much more rapidly under the brush than the dentin. In a number of teeth in my collection the tartar on the root is on the same plane with the surface of the cavity of erosion, and does not show the rounding off that is produced by the action of the brush. These are cases where the wearing away has been produced by some rigid object such as an artificial denture. In other cases the tartar is distinctly rounded off at the margins.

THE RELATION OF RHEUMATISM, GOUT, GASTRIC DISTURBANCES, ETC., TO WASTING.

This relation may best be considered in the present connection, since the supposed causal connection of these disturbances with wasting of the teeth is made to depend upon the vitiated secretions of the salivary or buccal glands.

The majority of authors on the subject of wasting call special attention to the causal connection of gout, rheumatism, arthritis, etc., to the same, without, however, having definitely established the fact that such a relation really exists. Nor is there uniformity of opinion among those who adhere to this view in a general way. Burchard ("Dental Pathology and Therapeutics," p. 249) emphasizes gout in particular as a fruitful cause of

wasting. "Most of the patients have a family history of gout, etc., and very commonly a personal or contemporary family history of rheumatoid arthritis or rheumatism. Even when the existence of rheumatoid or gouty affections is denied by both patient and medical attendant, it is rare that the patient does not complain of some general disorder." Darby, Jack, Kirk, and many others express similar views, while Michaels ("Du Rôle de l'Hyperacidité organique et des Sulfocyanures salivaires dans l'Abrasion chimique des Dents," page 10) writes that in the urinary and salivary analysis of persons suffering from chemico-abrasion the measure (*taux*) of total acidity is less than in the full (*francs*) hyperacids (gouty and rheumatic). From this it would seem that Michaels does not recognize chemico-abrasion as an accompanying symptom of either of these troubles. (Page 18, *loc. cit.*) However, he distinguishes sharply between the dental manifestations accompanying rheumatism and gout. "The arthritic diathesis accounts for (*expliqué*) other manifestations upon the tissues of the mouth—glossy gums, tophi deforming the jaws, pyorrhea, degeneration of the ligaments, agomphiasis, *affections peculiar to the gouty diathesis*." "Among the *rheumatics* the characteristic alterations are entirely different. The acidity of the saliva is in correlation with the sulfocyanid of sodium or ammonium. The local manifestations are—desmodynie alvéolaire, la constriction nerveuse palatale, l'aptyalie ou acrinie salivaire, l'hémodie, l'arthralgie maxillaire, penetrating caries, and *chemical abrasion*."

Then again, page 20: "According to my analyses and observations among the majority of hyperacids the reagents readily show sulfocyanid of ammonium or of sodium, and these may be easily determined in the microscopic preparations. But also among those subjects there is not a trace of chemico-abrasion."

In the "Essai de Sialo-Semeiologie," at page 65, he goes on to say that in the gouty diathesis only traces of the sulfocyanid are to be found in the saliva—by which again he excludes gout, since he

distinctly states that wasting is due to the action of potassium sulfocyanid.

I gather from the above that Michaels recognizes a relation between chemical abrasion and those rheumatics only who have *potassium* sulfocyanid in their saliva.

I am inclined to believe that, on the whole, perhaps too much importance has been attached to gout and rheumatism as predisposing or active factors in the production of wasting. It is true that we frequently find a history of gout or rheumatism, or both in cases of wasting; but these troubles, and especially rheumatism, are so common that I fancy the majority of human beings advanced in years can recall some time or other when they or their forefathers suffered from one or the other of them. Personally I have not found a preponderance of rheumatic or gouty persons among my patients. Of 53 cases in which an examination was made with reference to this question, 6 confessed to gout or showed evident signs of it, 8 were rheumatics, 1 complained of both of these troubles, 6 suffered from some digestive trouble, two of these being at the same time neurasthenics, and 33 denied all personal experience of either gout or rheumatism. In all cases in which wasting was associated with rheumatism or gout observed by me, the toothbrush and some gritty tooth-powder had been made use of in cleaning the teeth, so that it was difficult to determine whether any causal connection existed or not. It accordingly became necessary to examine a number of patients who made no use of brush and powder. In this examination I was assisted by my friend Stanley P. Mummery of London. We examined together, in the hospitals of Berlin and London, 24 cases of gout and 99 of rheumatism, 89 chronic and 10 acute. Among all of these there was not in any single case a trace of wasting, notwithstanding the fact that in many the secretions, as far as could be determined by testing with litmus paper, showed a stronger acid reaction than we find under normal conditions.

There was perhaps more than a usual amount of caries at the necks of the

teeth, but no disintegration of the enamel surfaces.

The cases which I examined personally, 18 gout and 83 articular rheumatism, were all very severe cases of hospital patients, mostly advanced in years and very many of them so deformed by the disease as to be rendered utterly unable to do any work. In 11 cases there were no teeth left, in the remaining 72 the number varied from 2 to 28; the majority, however, being limited to from 6 to 18, and many of those decayed, especially showing much decay at the necks, which were invariably found in a very dirty condition, the tooth-brush never being used.

Professor Riegner of Breslau has recently examined 2 cases of gout and 115 cases of articular rheumatism, all hospital patients, and although he set out in the hope and expectation of finding the defects under consideration, he writes me that the results were absolutely negative.

Now, while the number of cases of gout examined (26) may be too small to admit of drawing a definite conclusion, I think we must agree that the causal connection of this trouble with wasting appears doubtful. Especially, however, is this true of arthritis deformans (articular rheumatism), where the number of cases examined (203) appears to be quite sufficient to establish the conclusion.

In view of these results, I am at a loss to see how we are going to establish an important relation between the arthritic diathesis and wasting. The only escape is to be found in the supposition that if these arthritics had made use of the brush and powder they would have suffered more from wasting than others by reason of the fact that the teeth in arthritis are predisposed to wasting. That this supposition does not lie outside of the range of possibility is shown by the following experiments:

Three teeth were immersed in grape-juice that was kept at room temperature and renewed from time to time; two of them were brushed daily for one-quarter minute without powder in order to determine whether the insoluble crystals which form on the surface of the teeth in con-

junction with the brush might not cause wasting. As the effect produced after two months was only minimal, I began brushing one of the teeth twice a day for fifteen seconds with chalk; one month later the second tooth was subjected to the same treatment. At the end of the fourth month the first tooth was completely denuded of its enamel on the surface where it had been brushed. The second tooth was likewise denuded to a considerable extent. The third (unbrushed tooth) showed a number of chalky spots on its surface, where there was a slight loss of substance; otherwise it appears to have suffered little change. I now brushed this tooth for one-half hour with chalk, this being equivalent to the total amount of brushing received by the first tooth, which was brushed twice daily for fifteen seconds for two months. The effect was scarcely noticeable, and in no way to be compared with that produced on the first and second teeth.

These results seem to justify the conclusion that chemical and mechanical agents acting alternately at short intervals produce much more disastrous effects than when the chemical agent is allowed to act through a long period of time, and the total mechanical action is applied afterward.

On the basis obtained by the results of this experiment one might say that although the teeth of the arthritics examined by me showed no indication of the wasting process, had they been brushed daily a destruction of the enamel might have been brought about in a manner similar to that in the experiment recorded above. I am not prepared to state, however, that I am convinced as to the conclusive nature of this argument. I reserve the right to give a more definite opinion on a subsequent occasion.

IV. ACTION OF SUBSTANCES WHICH ATTACK THE ORGANIC CONSTITUENTS OF THE TOOTH.

As already indicated at the beginning of this series of articles, there are not a few authors of high repute (Znamensky,

Preiswerk, Michaels, A. Bastyr) who break with the historic conception that acids play the paramount rôle in the process of wasting, and who attribute this rôle to substances which attack the organic constituents of the hard tissues of the teeth. It was in the hope of adding somewhat to our knowledge of this phase of the subject that the experiments recorded under divisions IV to VI were undertaken.

(I) ACTION ON SOUND TEETH.

In the *Ohio Dental Journal* for October 1899, under the title "The Effect of Heat on Dentin," I gave the result of experiments showing the effect of temperatures of above 100° Celsius on dentin and enamel. When carious teeth were subjected to higher temperatures than 160° C. for ten minutes the carious parts were completely destroyed and the whole teeth were so brittle as to be easily broken in the fingers. The enamel suffered comparatively but slight change. Znamensky has pointed out that teeth in this condition readily developed defects similar to wasting when brushed, and there can of course be no question that such teeth would yield more readily to mechanical force of any nature whatever than would normal teeth. Of course we never have to do in the mouth with temperatures anywhere approaching the boiling-point, and yet the thought suggests itself that possibly the habit of drinking tea or coffee at temperatures about 70° C. might have upon the teeth a certain deleterious effect of the above nature. It seems, however, very doubtful.

In various communications to this journal—the first in 1890 (*Cosmos*, vol. xxxii, p. 253), I have called attention to the fact that substances which have a strong affinity for organic matter may prove injurious to the teeth by destroying the basis substance and leaving the tooth friable and consequently much more susceptible to mechanical action of any nature whatever. Bone becomes so disintegrated in a 10 per cent. solution of hydrogen dioxid, or in a 5 per cent. solution of caustic potash, that it may readily be

crumbled between the fingers. Sound dentin is likewise acted upon by the same solutions. A block of ivory was suspended for six months, at first in a 1 per cent., subsequently in a 5 per cent. solution of caustic potash. The ivory swelled up and became soft, almost cheesy, so that it could be easily cut with a knife. A chemical analysis gave—Water 26.3 per cent., salts 47.6 per cent., organic matter 26.1 per cent.

A sound human molar was kept for three days in a 1 per cent. solution of caustic potash. The cement in part crumbled away, and its attachment to the root was broken up so that it could be removed *in toto*. Sound teeth were kept in a 5 per cent. solution of caustic potash for three weeks. The roots became brittle and crumbled between the fingers. There was no visible action upon the enamel.

Sections of sound dentin in solutions of 5 to 10 per cent. of perhydrol or hydrogen dioxid became brittle in the course of a few weeks, the solutions being renewed from time to time.

Other less powerful chemical substances seem also to have the power of acting upon the organic matter of the dentin. If we treat ivory turnings for twenty-four hours with a 2 per cent. solution of potassium sulfocyanid the filtrate will give a flocculent precipitate with tannic acid; a similar result will be obtained with a 2 per cent. solution of sodium chlorid or even with water, which shows that all of the substances have the power of extracting *traces* of gluten from the superficial layers of hard dentin. The action is, however, very slight, being highly magnified in the experiments just reported upon, by the comparatively enormous surface of the ivory turnings exposed to the solutions. The solvent action also decreases gradually, and in the majority of my experiments practically ceased in three days. None of these substances act upon the enamel, so far as I have observed.

(II) ACTION ON DECALCIFIED DENTIN.

The action of the above and various

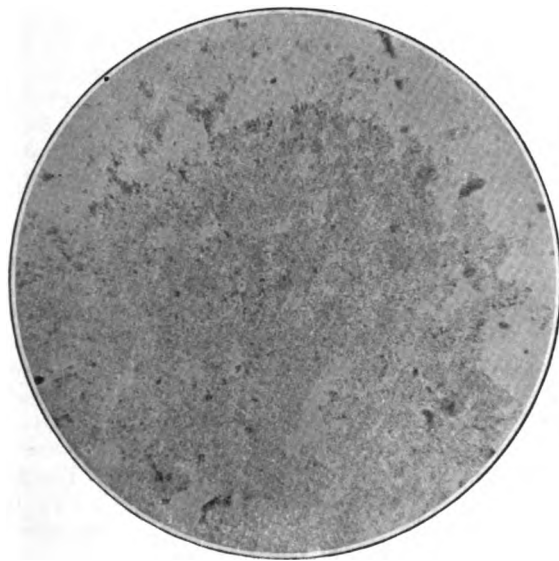
other substances upon decalcified dentin is much more pronounced.

If carious teeth are placed in a 5 per cent. solution of caustic potash or in hydrogen dioxid the carious dentin will be dissolved out, leaving the cavity as clean as though it had been prepared for filling.

Decalcified dentin is readily dissolved in vapors of nitric or nitro-hydrochloric

to pieces in three weeks. All or nearly all of the substances which occur in the mouth were tested in various strengths with reference to their action upon decalcified dentin. The most remarkable results were obtained by the action of solutions of oxalic acid. A tooth with a large cavity on the grinding surface having a thick layer of leathery dentin was

FIG. 40.



A section of decalcified dentin 20 microns thick, undergoing complete dissolution under the action of a 5 per cent. solution of oxalic acid.

acid, or in the vapors arising from the mixture of nitric and sulfuric acid. Five per cent. solutions of sulfuric acid rendered decalcified dentin brittle in eighteen days, while solutions of acetic and nitric acid produced little change.

Decalcified ivory turnings treated for twenty-four hours with 1 to 2 per cent. solutions of caustic potash, hydrogen dioxid, potassium sulfocyanid, or even with common salt, etc., give dense precipitates in their filtrates with tannic acid, as well as a beautiful purple color on treating with caustic potash and a trace of copper sulfate. (Biuret reaction.)

In a 3 per cent. solution of hydrogen dioxid thin sections of dentin crumbled

placed in a test tube with a concentrated solution of oxalic acid, and kept in the incubator. At the end of four days the carious dentin had become quite rotten and could be brushed away with a toothbrush. A 5 per cent. solution of potassium sulfocyanid had a like effect in thirteen days, but this experiment must be repeated. Sections of decalcified dentin 20 microns (1-50 mm.) thick were perforated or completely dissolved in 2 per cent. solutions of oxalic acid in six to eight weeks and in 5 per cent. solutions comparatively sooner. (Fig. 40.)

A slight macerating action on thin sections was manifested also by solutions of potassium sulfocyanid in acid cal-

cium phosphate. Indeed these substances sometimes completely destroyed pieces of decalcified dentin in a few weeks, perforating them in every direction very much as represented in Fig. 41. I noticed, however, in these cases, that the pieces of dentin were subject to a growth about them of a fine mycelium which sometimes escaped notice in the macroscopic examination. This on cultivation proved to be an *aspergillus*. In a few drops of a 1 per cent. solution of lactic acid this organism completely dissolved thin pieces of decalcified dentin in eight days. (Fig. 42.) It seems probable, therefore, that the action which took place in the two solutions last mentioned was due to the *aspergillus* and not to the solutions themselves. In experiments in which the mycelium was successfully avoided the action of the solutions in six weeks was very slight.

Physiological solutions of sodium chlorid, as well as saliva, to which chloroform had been added to prevent bacterial action, showed no dissolution. Sodium sulfate 1:200, ammonium oxalate 1:200, ammonium chlorid 1:200, had no visible action except where a development of bacteria took place. The amount of work necessary in carrying out these experiments was so great that a definite solution of the questions involved could not be accomplished up to the present, but must be reserved for a future occasion. I may say, however, that in no case have I ever observed even such powerful solvents as hydrogen dioxid or caustic potash produce a smooth, polished surface. This can only be brought about in conjunction with mechanical agents, as dealt with under division V.

V. ACTION OF SUBSTANCES WHICH ATTACK THE ORGANIC CONSTITUENTS OF THE TEETH IN CONJUNCTION WITH MECHANICAL AGENTS.

There is scarcely any room for doubt that any substance which has the power of extracting the basis substance from the enamel or dentin, making them thereby friable, would render them more susceptible to mechanical action of what-

ever nature in the mouth, and thus contribute to the production of wasting. This theoretical deduction is confirmed by the results of experiments.

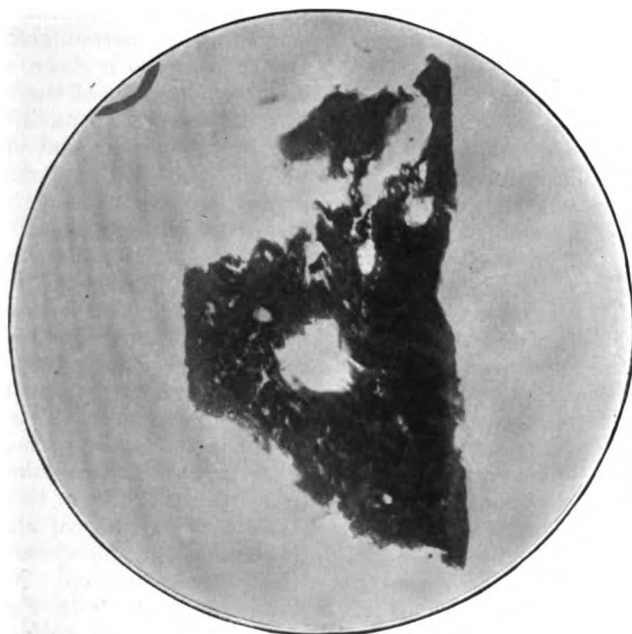
A block of ivory was immersed for one-half its length in a 5 per cent. solution of caustic potash, and daily removed and brushed with 10 per cent. pumice. The part acted upon by the alkali brushed away much more rapidly than the other. Again, the facial surfaces of the teeth of a lower jaw were covered with a thin layer of cotton, which was kept moist with a 10 per cent. solution of hydrogen dioxid for one year and three months. Every day the cotton was removed and the teeth brushed for approximately fifteen seconds with 5 per cent. pumice. Deep grooves were worn in the teeth at the necks, somewhat deeper than according to my experience would have been produced by the brushing without the dioxid. The grooves were typically wedge-shaped, in some cases slightly undermining the enamel. Brush-marks were plainly visible on the surface of the enamel, but I cannot say definitely that they are more pronounced than would have been produced by the brush and powder alone. The enamel margins are sharp, and in two of the teeth more jagged than we are accustomed to see them in natural wasting.

Three teeth in a 5 per cent. solution of caustic potash, brushed twice daily with 20 per cent. pumice for five weeks, showed, on the other hand, no more action of the brush than where the brushing took place with pumice and water only.

In a second experiment, four teeth were fixed in sealing-wax and treated severally with 10 per cent., 5 per cent., and 1 per cent. solutions of caustic potash, to compare with the control, which was treated with water only. All were brushed alike twice daily for from fifteen to twenty seconds with chalk. At the end of six weeks no difference could be detected in the amount of wearing.

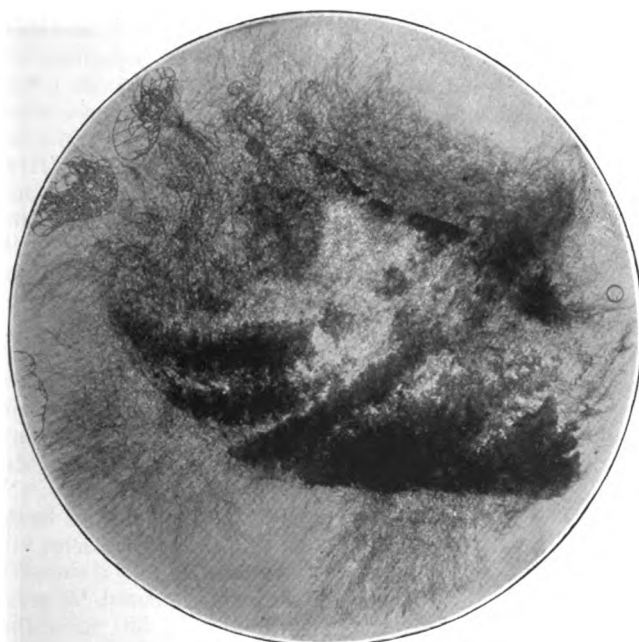
We may conclude from the above results that while theoretically the wasting process may be accelerated by all substances that attack the organic matter

FIG. 41.



A section of decalcified dentin about 100 microns thick undergoing dissolution in a solution of acid calcium phosphate in the presence of a mold

FIG. 42.



Action of a pure culture of aspergillus in a few drops of a 1 per cent. solution of lactic acid, on decalcified dentin.

of the dentin or enamel, practically this acceleration is but slight, even where solutions are used which are many times more powerful than any which are found in the mouth. In the mouth itself I am inclined to think that this action is a quantity altogether negligible.

From a teleological point of view it seems highly improbable that compounds normally occurring in the mouth, of whatever nature, have any deleterious effects on the teeth, and in particular on the enamel; we should, furthermore, be forced to expect such effects to appear in excessive degree in the dog, horse, and other animals whose saliva is intensely alkaline as compared with human saliva. Still less probable does it appear that other neutral or indifferent constituents of the saliva have any deleterious effect upon the hard tooth tissue, or take any part in the production of wasting.

The only substance thus far examined to which I am prepared to concede a certain influence in this direction is oxalic acid. Should it really occur in the mouth in appreciable strength, it might well have the effect of rendering decalcified dentin rotten, so to speak, or of assisting in its total dissolution, thereby influencing the character of caries as well as the progress of wasting.

Even sections of hard dentin in solutions of oxalic acid do not undergo the ordinary process of decalcification as produced by other acids, but become rather brittle and rotten, or fall to pieces in a number of weeks, depending upon the strength of the acid and the thickness of the solution. Mucic acid seems to have a similar though less pronounced effect, but I cannot speak definitely on that point at present.

In this connection I wish to call special attention to that mysterious substance to which so much both good and evil in the human mouth has been attributed—potassium sulfocyanid.

THE ACTION OF POTASSIUM SULFOCYANID UPON SOUND TEETH.

Potassium sulfocyanid has been brought into prominence by Michel of

Würzburg, who declares it to be the protecting influence in the saliva against caries, and in particular by Michaels of Paris, who puts it down as the cause of abrasion chimique of the teeth (page 21, "Du Rôle de l'Hyperacidité," etc.). He writes, "Potassium and ammonium sulfocyanids dissolve the ossein of the dental organs and expose the mineral elements, forming with them a calcium sulfocyanid and soluble ammonium and potassium phosphates." On page 20 he writes, "It is this last element (potassium sulfocyanid) which in my opinion is the cause of the process"; and finally ("Essai de Sialo-Sémiologie," page 66): "Potassium sulfocyanid causes wasting." This conclusion of Michaels does not, however, agree with the results obtained by Gautrelet (pages 19, 20, of the "Essai"), who states that in cases of chemico-abrasion the base of the sulfocyanid is not potassium, but *ammonium*. Also in the case shown by Michaels in Fig. 1, Gautrelet found ammonium sulfocyanid in the saliva of the patient (pages 21 and 22).

Personally I have considerable difficulty in recognizing any action of potassium sulfocyanid on sound teeth. I have subjected teeth in every form—whole teeth, halved teeth, sections of teeth—to the action of potassium sulfocyanid in various concentrations for as much as six weeks in succession without the slightest visible effect. Also potassium sulfocyanid 1:1000 applied after the manner described in the experiments of Michaels (page 24) did not have any effect upon the enamel or dentin. A molar was ground down on one side so as to expose the dentin, and 1:1000 solution of potassium sulfocyanid made to drop at the rate of 40 to 80 drops a minute upon the side of the tooth for ten days. This was followed by a solution of double strength—2:1000—for fourteen days, and this again by a solution of quadruple strength—4:1000—for five days. No sign of any loss of substance could be detected at the close of the experiment.

Again, Michaels states that abrasion *chimique* is caused by secretions of the labial glands, but according to Hougouenq the buccal mucus does not contain

any sulfocyanid, nor have I been able to detect it in fifteen different tests where pains were taken to prevent the access of saliva.

Remembering, on the other hand, that potassium sulfocyanid is secreted in particular by the parotid, and keeps constantly trickling down the surfaces of the upper molars, we would expect to find those teeth riddled if potassium sulfocyanid had any eroding action on them. We have here a beautiful experiment going on through life with negative results, which alone seems sufficient to put potassium sulfocyanid as a cause of wasting out of the question.

I doubt very much whether there is any substance in the saliva, either in healthy or diseased conditions, belonging to the group treated under division IV, which materially influences the process of wasting in otherwise sound—undecalcified—teeth. It lies much more within the bounds of possibility that the substances under discussion may, in connection with acids, have a certain influence over the progress of wasting, namely, by dissolving the dentin decalcified by the acid, or at least by rendering it brittle and therefore more susceptible to the action of mechanical agents. This point is more clearly brought out under division VI below.

VI. ACTION OF ACIDS ALTERNATING WITH SUBSTANCES WHICH DESTROY THE ORGANIC TISSUE OF THE TOOTH.

From all of these experimental results it seems that certain substances in the mouth have a macerating action on decalcified dentin, exceedingly slight in most cases, but in some possibly strong enough to merit consideration. An action of this kind would tend to accelerate not only the process of dissolution in the second stage of caries, but also render such thin layers of dentin as may be softened by the action of acids more susceptible to the action of the brush, and thereby accentuate also the process of wasting.

This fact is demonstrated by the re-

sults of the following experiment: A section of the lower jaw containing three teeth was subjected to the action of $\frac{1}{2}$ per cent. solution of lactic acid, alternating daily with a 10 per cent. solution of hydrogen dioxid. In the course of six weeks defects were produced at the necks, extending quite around the teeth. (Fig. 43.) The defects are strikingly similar

FIG. 43.



Action of acid and hydrogen dioxid alternating.

to cases which have been reported of wasting of the approximal surfaces of the lower incisors. (No instance of this has come to my personal notice, in spite of the fact that I have examined over 300 cases of wasting within the last three years.) It is doubtful, however, whether these substances are found in the saliva in sufficient concentration to produce this effect. Further experiments with more dilute solutions are necessary to clear up this question. The fact that thin sections of decalcified dentin are not dissolved in human saliva, so long as it is kept free from bacteria, seems to indicate that under normal conditions this process, if present at all, is reduced to a minimum; under certain pathological conditions, and in rare cases, it may possibly acquire greater importance.

On the whole, I am forced to the conclusion that agents which attack the organic constituents of the hard tissues of the teeth are of very minor importance in the causation of wasting.

VII. ACTION OF FERMENTS IN THE PRODUCTION OF WASTING.

It is a well-known fact that many bacteria produce ferments of the nature of trypsin by means of which they can dissolve albuminous and albuminoid substances in the presence of an alkaline reaction. I have already referred to the views of Arkövy and Preiswerk in relation to this question in the *DENTAL COSMOS*, 1905, vol. xlvii, p. 1294.

Preiswerk inclined to the idea that certain bacteria might produce caries of the teeth by acting upon the organic matter first, instead of upon the inorganic, as the generally accepted theory states. He also is inclined to believe that wasting, particularly at the neck of the tooth, is a kind of caries produced by the proteolytic (proteid-dissolving) power of bacterial enzymes. (*Schweizerische Vierteljahrschrift für Zahnheilkunde*, April 1903, p. 127.)

The question accordingly arises whether bacterial ferments may extract the organic constituents of the enamel or dentin, and so make it brittle or more susceptible to mechanical action. In view of the fact that much more powerful chemical bodies—such as caustic potash and hydrogen dioxid—affect the enamel very slowly, I am of the opinion that the above question must be answered in the negative so far as the enamel is concerned; nor does it seem probable that their action on the sound dentin can be more than very minimal, especially as wasting always occurs at points where there is no accumulation of bacteria. So that I am inclined to exclude bacterial ferments altogether so far as their action on the sound tissue is concerned. The possibility of a certain action on the *decalcified* dentin cannot be denied, particularly as we know that the second stage of caries is for the most part nothing more or less than the dissolution of the decalcified dentin by bacterial ferments. We might therefore conceive that bacterial ferments acting in conjunction with acids would dissolve the dentin as fast as it is decalcified, leaving a hard surface beneath to be kept polished by the friction

of the lips and food. Inasmuch, however, as the surfaces affected by the process of wasting are kept almost absolutely free from bacteria, it is not easy to see how any action of this kind can take place. We know, on the other hand, that whenever the gums begin to grow over cavities of wasting so that food and bacteria may accumulate, the wearing away stops, and we get softening and caries. I see no way at present of establishing evidence in favor of the view that bacterial ferments are factors of importance in the matter in question.

VIII. ELECTRICAL ACTION IN THE MOUTH AS A CAUSE OF WASTING.

I have thus far been able to obtain no evidence in support of the theory that wasting is caused by the electrolysis of the salts contained in the oral fluids. The following experiments were made: A bicuspid was connected by means of a platinum wire, bound around the crown near the neck, with the positive pole of a Siemens battery of 3 units, and another bicuspid in the same way with the negative pole. The teeth were now dipped into the two arms of a U-shaped tube filled with a physiological solution of common salt. On closing the circle a galvanometer having a multiplier of 1000 turns and a resistance of 200 Siemens units showed a deflection of 31°; at the end of two weeks this deflection amounted to 8°. During this time a groove about $\frac{1}{2}$ mm. deep had been eaten into the neck of the tooth connected with the positive pole; the other tooth showed no change. This experiment was made in the year 1881, and reported in the *Deutsche medizinische Wochenschrift*, No. 29.

In a second experiment recently made, a battery of 3 dry cells was used, and the experiment continued in the same way for two weeks. In this case the platinum wire had eaten its way through the enamel, and had caused considerable softening of the dentin. This was only the natural effect of the chlorin which is liberated upon the surface of the tooth in contact with the platinum wire. The

result was simply decalcification. It is possible that by modifying the experiment so that the current passes through a solution alternately in opposite directions, the tissue, in this case decalcified by the chlorin, might be destroyed by the caustic soda liberated on reversing the current. I have had as yet no opportunity of performing this experiment.

TREATMENT OF ABRASION AND CHEMICO- ABRASION OF THE TEETH.

The treatment may be either therapeutic or prophylactic, or both. The therapeutic treatment consists in restoring the lost portions by means of porcelain or gold, and occasionally amalgam. Porcelain fillings protect the surrounding tissue better than gold. Pink gutta-percha, otherwise an excellent material, is debarred by its color and by the difficulty of anchoring it in shallow smooth-bottomed cavities.

In deciding upon the prophylactic treatment to be adopted we must be guided by the results of the examination as to whether it be a case of abrasion only, or of chemico-abrasion. We must determine also whether the process is one of long standing or of recent origin, and the rate at which it is at present progressing.

We examine the tooth-powder and the brush, and inform ourselves as to the manner in which the teeth are brushed, whether once or more daily; how long at a time; how often powder is used; whether the brush is dipped once into the powder or several times; the amount of pressure applied, etc. The teeth should be dried and examined with a magnifying glass, and the appearance of the surfaces carefully noted. Particular attention should be given to the condition of old fillings.

The treatment consists in prohibiting the use of all gritty powders or pastes, and limiting the use of other powders to once a day, or, where the enamel has been destroyed, to three times a week. The brush without powder may be used

after every meal, or as often as may be necessary in order to keep the teeth free from particles of food.

If evidences of acid action (chemico-abrasion) are present from whatever source, it should be counteracted by such means as are indicated in each individual case. Usually the free use of sodium bicarbonate or milk of magnesia may have a beneficial action, and if the acid condition results from some systemic derangement the treatment must be directed at the same time against the latter. The tooth-brush should be sparingly used and tooth-powders avoided during recourse to grape and similar cures.

I have attempted in the foregoing series of communications to make an absolutely objective presentation of the results of observations and experiments which I think everyone will acknowledge to be exceptionally extensive and painstaking. The great difficulties which are encountered in dealing with many problems relating to the pathology of the teeth and contiguous parts were encountered here in full measure. For this reason it will be readily understood that it was not possible to present a definite answer to many of the questions which came up in the course of the work. I trust, however, that the workers in this particular field—of whom there are many at present in America—may find some help in my pages, as I have found in theirs.

I propose to return to this subject later, after the mass of evidence which has been accumulated has become more thoroughly digested.

I wish to express my indebtedness to all who have done good work in connection with the study of wasting, especially to Drs. Truman, Darby, Kirk, Burchard, Zsigmondy, Bastyr, Cook, and a host of others; also to those who have made it possible for me to examine an exceptionally large number of cases in practice: Drs. Abbott, Barrows, Brausewald, Davenport, Dentz, Freund, Frohmann, Gordon, Grevers, Hayden, Heydenhauss, Jenkins, Körbitz, Hielscher, Mamlock, Stanley, Mummery, Pulvermacher, Rieg-

ner, Rosenberg, Schramm, Ramsey, Watson, Watling, Wittkowsky, Warnekros, York.

I deduce the following conclusions from the results of my investigations:

CONCLUSIONS.

(1) Wasting of the teeth is for the most part a purely mechanical process (abrasion), in which the chief and often only factor concerned is the tooth-brush in conjunction with tooth-powder. While all powders or pastes containing pumice, cuttlefish bone, or oyster-shell are particularly injurious, excessive brushing with milder preparations may severely abrade the dentin, and in the course of years even the enamel. Abrasion may be readily produced artificially by the action of brush and powder.

(2) By far the great majority of cases of so-called wasting of the lingual surface of incisors and canines are produced by the friction of artificial plates or clasps.

(3) It has not been conclusively proved that wasting may occur, even in isolated cases, without the use of the tooth-brush or some corresponding mechanical agent.

(4) Coarse foodstuffs, under ordinary circumstances, as well as the crystallized salts of the saliva in general, are factors of but very minor importance; likewise the friction of the mucous membrane.

(5) Acids in general, especially in the strength in which they occur in the mouth, cannot produce wasting. They decalcify the tissue, rendering the enamel chalky and friable, and the dentin soft. Further than that their action does not go. Erosion in other words is never identical with wasting. Only vapors of powerful acids—strong nitric acid, mixtures of nitric and sulfuric acids, etc., which attack the organic constituents of the tissue about as readily as the inorganic—can produce effects resembling wasting with a minimal amount of friction.

(6) Acids in motion—running, trickling, dropping—act much more intensely on the enamel than acids at rest. Carbonic acid attacks both dentin and enamel vigorously.

(7) Enamel which has been disintegrated by an acid becomes thereby much more susceptible to wearing by mechanical agents. Decalcified dentin, on the other hand, is less susceptible than normal.

It results from this that wasting of the enamel is accelerated by the action of acids, *i.e.* chemico-abrasion of the enamel is more readily produced than simple abrasion. Wasting of the dentin is not accelerated by the action of acid; it may even be retarded or prevented altogether.

(8) Only those acids, however, that have a strong decalcifying power over the dentin retard wasting; oxalic and tartaric acid, and possibly certain others, are devoid of this action. Whether the acid only dissolves the calcium salts of the tooth or decomposes them, and whether it forms soluble or insoluble compounds with them, probably influences their action materially.

In order to produce wasting under the influence of acids a certain relation must be maintained between the mechanical and chemical action. If the latter predominate, we get decalcification and caries but not wasting, or we may have both occurring side by side.

(9) Under the continued action of an acid the repeated application of friction at short intervals produces more effect than the application of the total amount of friction at one time.

(10) There is no specific acid concerned in the production of chemico-abrasion. Any acid occurring in the mouth—that is, any which has the power of attacking the enamel—may take part in the process.

(11) Chemico-abrasion differs from abrasion in its greater tendency to attack the enamel of the teeth.

(12) Destructive processes sometimes observed in connection with typhus, chronic gastritis, etc., or as a result of excessive use of grapes, lemons, or sour oranges, or of the injudicious use of acid medicines, assume a character more or less resembling chemical abrasion, provided the brush and powder are diligently employed.

(13) The relative rapidity with which

the different tissues of the tooth wear away in comparison with fillings may furnish a means of determining whether we have to do with a simple case of abrasion, or whether an acid is concerned in the process (chemico-abrasion).

(14) Substances that attack the organic constituents of the teeth (heat, hydrogen dioxid, strong alkalis) make the teeth friable and consequently more liable to wear by friction. The effect of alkalis occurring in the saliva is, however, exceedingly slight, if indeed it can be said to exist at all.

(15) The substances enumerated under 14 have a much more pronounced effect upon decalcified dentin. Likewise oxalic acid—and possibly to a slight extent certain other substances enumerated—disintegrates sections of decalcified dentin in the course of time, and when present in appreciable quantities may,

apart from its decalcifying action, influence the progress of caries as well as that of chemico-abrasion.

(16) Substances which attack the organic and anorganic constituents of the dentin alternately may produce wasting with a minimal application of mechanical action.

(17) I was not able to find any action on the part of potassium sulfocyanid, either in producing wasting or in predisposing the teeth to it.

(18) The connection between the acid diathesis—in particular gout and rheumatism—and wasting, does not appear to be as intimate as has generally been supposed.

(19) No satisfactory evidence has been produced up to the present in support of the view that bacterial enzymes or electrolytic processes perform an important rôle in wasting of the teeth.

TREATMENT OF PYORRHEA ALVEOLARIS.

By GORDON WHITE, D.D.S., Nashville, Tenn.

(Read before Section III of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

I ESTEEM it an honor to be asked to tell how I cure pyorrhea alveolaris, since we have many gifted men in our association who have done so much in the line of pathology and treatment of this destructive disease. I bring to you no untried theories, but will briefly describe the treatment which has given me the results which I will later place before you on the screen.

No disease with which we come in contact so absolutely baffles our skill and has its own way in ridding our patients of their teeth and health as does pyorrhea. I think I state a fact when I say that the larger percentage of our profession say unequivocally to their patients, "It cannot be cured; you will lose your teeth." Any other statement to patients

who continually do those things which lower their vitality—such as overeating, using alcoholic drinks and tobacco, or who are indifferent to the hygiene of their mouths and disregard serious functional disturbances, such as intestinal indigestion, etc.—would be reckless in the extreme, and would place a man who has promised a cure in a most embarrassing position toward his practice; yet one might as well say that tooth-decay or malaria cannot be cured under treatment and changed conditions.

Few there are, if any, among us who have not seen clearly manifested in the gums the effect of nearly all constitutional lesions or auto-poisoning, of whatever nature. Any lowered vital or abnormal condition is shown in the

mouth, and there is scarcely any pathological condition that an inflamed or suppurating condition of the mouth will not accelerate or produce.

Indeed, in its poisoning effects it works as automatically as does any law of mechanics.

My observation is that nearly all the gum troubles lead to pyorrhea, and in its treatment, even before a thorough examination is made, the mouth is mopped, sprayed, or rinsed with some antiseptic, such as dioxogen, for cleansing. Afterward a general and thorough examination with a smooth instrument is made of all the teeth so affected, and treatment is begun upon the most important ones, or those most involved, by applying to the gum and injecting into the pockets any one of the reliable local anesthetics, and after a few minutes removing the deposits with a rigid, delicate instrument. The success of this operation, in many instances the most delicate in the field of surgery, is greatly dependent upon the thoroughness with which it is performed, for the thin layer of what is commonly called serumal calculus can rarely be seen, and yet can be scraped to an infinitesimal thinness, even with well-adapted instruments, without its removal being accomplished. For do what we may in the treatment, surgically and medicinally, so surely as any of the deposits remain, just so surely will every effort at cure meet with failure.

During the surgical operation of removing these deposits, the patient is permitted at intervals to rinse the mouth thoroughly with some antiseptic wash, the anesthesia being kept up by dipping the instrument in use in a few drops of the anesthetic agent conveniently placed, thereby carrying to the bottom of the pocket on the point of the instrument a minum of the drug each time it is inserted.

Of course teeth which are loose must, in the way deemed best by the operator, be fixed in their positions—bad occlusions corrected by disarticulation, and the teeth placed at rest; for it is difficult to estimate the nervous strain this defect alone produces.

There are many ways of fixing the teeth. The means most frequently used are silk ligatures, united bands, united crowns, and spring splints. The latter, which in many instances have given great satisfaction, are constructed by swaging a piece of gold plate to the lingual and buccal or palatal and labial surfaces, according to the location of the affected teeth, and subsequently uniting these plates with platino-iridium or clasp-metal spring wire, which when snapped over both sides of the teeth is a most excellent method of securing them, and affording easy removal for cleansing. The wire or spring is of course passed from one plate to the other between the mesio-distal-occlusal surfaces.

When some of the teeth are missing, the remaining loose teeth can be made most serviceable by bridges. All roots of molar teeth not attached to their alveoli should be amputated, for the remaining roots, properly treated, can be made to do valuable service for years in the support of crowns and bridges, and where bridges are necessary, they of course make the best possible stays or splints. The cusps of these crown abutments, however, as well as the intervening crowns, should be short or flat, in order to lessen the strain on the delicate roots which always occurs when the cusps are long or high. The bands of these crowns should never be allowed to extend under the gums, for constant local irritation will cause a return of the trouble at these points.

It has been my custom for years to put on bridges that can be removed without difficulty. This is done by lining the crowns and covering the pins with a chloroform solution of gutta-percha or Evans' gutta-percha cement, and as the chloroform evaporates, the crowns will fit closely on the prepared wet stumps. This accomplished, the gutta-percha is dried with alcohol, and the bridge is set with cement as though no lining had been used. I prefer Evans' gutta-percha cement, however, because it melts more easily upon heating than does gutta-percha, should the removal of the bridge ever be necessary.

I do not hesitate to remove the pulp from any of the teeth greatly affected, and where there is enough bone remaining to justify an effort to save the tooth. I have rarely known a case that was not benefited and the usefulness of the tooth prolonged by the extirpation of the pulp. Just why this is I do not know, neither do I know of anyone who does. It may be due to some change in the blood supply to the locality, for among teeth involved to that extent, few contain normal pulps.

After a thorough removal of all deposits, the pockets are washed with warm water. This is followed by injecting very gently a drop or two of pure lactic acid, to which have been added four drops of formalin to the ounce. As both the acid and the formalin are somewhat painful in their action, being rather escharotic, the shallow pockets are usually swabbed out with a little cotton wrapped on the point of such an instrument as a broken Donaldson broach, thus keeping so much of the acid from coming in contact with the mucous membrane. Just here I wish to say that there is nothing better for detecting any remaining deposits, however small, than this little cotton-covered instrument.

Before applying the acid, however, the lips—indeed a considerable area about the mouth—should be smeared with a little oleostearate of zinc—now called emoleo—to prevent the acid from burning, for should it come in contact with the lips or chin it is almost sure to produce what the patient calls “a fever blister” or “cold sore”—although we of course know it to be an eschar.

When the syringe is used, rolls of bibulous paper should be so placed about the pockets as to absorb the surplus acid. I have found nothing better for neutralizing the effect of the acid on the mucous surfaces, or more soothing to the membrane, than to rinse the mouth with milk of magnesia.

These precautionary measures are worth while, for the subsequent suffering is such as to make it a duty to prevent all that is avoidable.

Lactic acid was suggested to the pro-

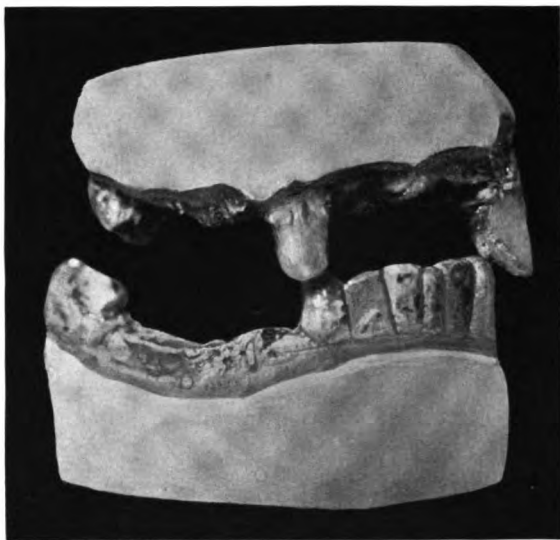
fession for the treatment of this disease a number of years ago by Dr. W. J. Younger. This, combined with a few drops of formalin, as I have suggested, gives me results that I have not been able to obtain from any other agent. However, when the roots are sensitive, I have for many years applied zinc chlorid or a saturated solution of silver lactate, with most satisfactory results. The silver lactate has much the effect of the nitrate, without apparently causing so much or so dark a discoloration.

After the surgical and medicinal treatment the pockets are not disturbed for a week or ten days, but the official tincture of iodine is applied to the gum about every other day, and the patient directed to use some antiseptic mouth-wash half a dozen times daily. Should the pockets then show no sign of healing, it is perfectly certain that there is something remaining in them which should be removed, either a scale of deposit or some foreign substance which has lodged and acts as an irritant, and which demands that the surgical treatment be repeated from time to time until healing occurs.

It is my practice to keep under my observation each case until the recovery is manifest, for in no other way can the wound be kept clean from irritating agents, such as particles of food, etc. I consider it quite as necessary that the dental surgeon should look after his cases of pyorrhea after the operation as it is for the general surgeon to see his cases after major interventions. As the latter's cases need dressing, just so do our cases of pyorrhea need attention. Absolute cleanliness is necessary. As nothing so delays a cure or causes a return of the disease as filth, I show my patients how to clean their teeth, and insist on their doing so with a good stiff brush, for three minutes, not less than five times a day: on arising in the morning, after each meal, and just before retiring.

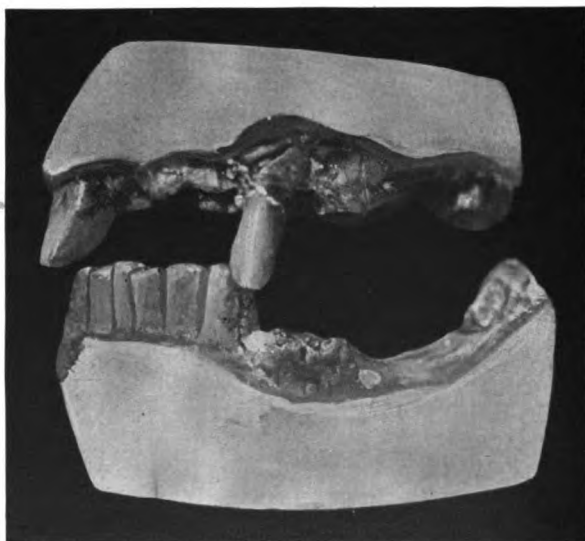
Massaging the gums with the fingers is always of the greatest benefit, and I demand that this be done frequently, and as thoroughly as possible. Let me say that on the dismissal of the case I always urge an occasional visit, and the hygiene

FIG. 1.



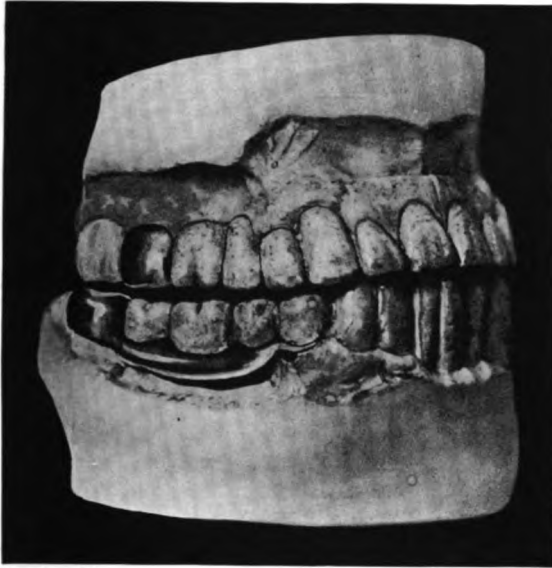
Case I. Right side before treatment.

FIG. 2.



Case I. Left side before treatment.

FIG. 3.



Case I. Right side after treatment.

FIG. 4.



Case I. Left side after treatment.

of the mouth may be looked after and irritations relieved, to prevent any recurring inflammation; for should the patients again become indifferent to their general condition, and careless as to the care of their mouth and teeth, the osteoclasts will resume business.

As to constitutional treatment, much more depends upon the manner of living than upon the administration of drugs. To quote Dr. C. N. Peirce, "When I have gotten my patient to drinking water, I think I have accomplished much toward a cure of this dreaded gum disease;" so one of my most urgent injunctions is to flush the sewers, take an internal bath.

The customary diet of white bread, red meats, starches, sweets, etc., is changed for one of coarse breads—made of pure graham flour and country corn meal—nuts, fruits, and vegetables, with the caution against overeating.

The importance of deep breathing, exercise in the open air, and well-ventilated sleeping apartments is insisted upon. In other words, the patients are impressed with the importance of wholesome living, and made to feel that conditions must be changed, and that their co-operation is a necessary factor to the success of the treatment.

Occasionally one of the tonics or alkaline agents is prescribed, with more or less favorable results. In cases of a torpid liver, calomel is often a valuable agent. My general practice of late years, however, has been to put as few drugs as possible into my patients' stomachs.

CASE I.

Figs. 1 and 2. These casts represent the mouth of a lady fifty-seven years of age, anemic and rheumatic, who had for years lived principally on meats and sweets, white bread, pastries, etc. It practically shows the case as it fell into my hands, wearing an old celluloid plate to fill the spaces caused by the loss of teeth, except in the case of the crowns of the upper right first bicuspid and upper

right second molar, upper left second bicuspid and upper left third molar, and lower bicuspids, the roots of these teeth having been prepared to receive artificial crowns, and side bridges were made before saving the cast was thought of. As you see from the illustration, it is a pronounced and serious case of pyorrhea alveolaris; the gums are greatly swollen and pus is oozing from the socket of every tooth; all the teeth are very loose, save the lower bicuspids and upper left second bicuspid; the alveolar septa between the upper right second and third molars is entirely gone; also from the mesial surfaces of the upper left third and lower third molars the instrument could be easily passed to the curves of the apical ends of the roots. There was a great waste of process around both the upper canines and lower incisors, as can be readily seen in the accompanying illustration; indeed the upper canines were so loose that the cusps could be brought about half an inch nearer to each other with the thumb and finger; besides, the right canine was the seat of a chronic abscess, discharging at the margin of the gum. This tract was thoroughly scraped, also the apical end, the canal was filled in my usual way, and the pyorrhea treated as heretofore described. The crown was disarticulated, which, in a measure, put the tooth at rest.

The molars and bicuspids were cut off, one side at a time, which put those roots at rest.

Notice that after the upper left third molar was prepared for the band, it was much lower than the summit of the ridge. I hesitated before undertaking the treatment of this tooth, so great was the waste of process and so loose was the tooth. The lower incisors were ligated with silk thread for four months, at the end of which time they had become tight and comfortable. The side bridges having been made one at a time, thereby preserving the natural bite, the bridge to supply the lost upper incisors and bone under the lip was now made. For this purpose you will see from Figs. 3 and 4 that a two-incisor gum section for vul-

canite work was made use of, and answered the purpose admirably. This last bridge, however, was locked to the side bridges by lugs put into the crowns or the gold grinding surfaces of the bicuspid, thereby making a continuous bridge of the entire upper jaw except the right third molar. The lower bridges were made of the "saddle-back" teeth, except the crowns of the third molars, which of course were supplied with the usual gold shell crowns.

Six months were consumed in the treatment of this case, soon after which time the patient had gained twenty-seven pounds. She had regained her former agility of step, the roses had returned to her cheeks, and she looked to be thirty-seven instead of fifty-seven. This was eight years ago. I saw her recently, and can assure you that her mouth is in a thoroughly healthy condition. Needless to state that the diet and her entire habit of living were changed in the course of treatment, and that no drugs were given internally. Figs. 3 and 4 show the case as I dismissed it, and as it is today.

CASE II.

Figs. 5 and 6 show the casts of the mouth of a maiden lady forty-seven years of age, suffering from one of the most serious cases of pyorrhea I have ever seen. Every tooth was loose save the lower right third molar. She also suffered from torpidity of the liver, constipation, intestinal indigestion to a rather unusual degree, and was a typical case of uric acid diathesis. Before the impressions were taken, that I might not remove some of the teeth with the impression, an old upper bridge anchored to the upper right second bicuspid and first molar was removed, the bicuspid root coming away with the bridge. Finding no attachment, distally and lingually, of the lower left bicuspid, the crowns were cut off at their necks, disarticulating and putting them at rest; the pulps were extirpated and the canals filled. The lower left second molar was split with a dentate fissure bur, and on removing the distal root, no

bone whatever was found on the distal side of the remaining mesial root, or the mesial surface of the mesial root of the third molar, nor was there any process to be found on the disto-buccal and lingual sides of the lower right second bicuspid, or the mesial surface of the mesial root of the lower right first molar. The roots of the upper right molar, which had held the bridge, were resting in about a quarter of an inch of bone, and consequently the bifurcations were greatly exposed, both mesially and buccally, allowing the instrument to pass readily in both directions. The buccal plate of the alveolar process over the roots of the upper left first molar was entirely gone, and naturally the buccal bifurcation, as well as the buccal surface of the buccal roots, was wholly exposed.

I extracted in this case the upper right lateral, the lower left central and lateral incisors, and the canine, as each of these teeth, by reason of its slight attachment, would have dropped out at the least provocation. As I progressed in my study of the case, I found I could not use the lower right third molar, and though it was the only firm tooth in the mouth it was extracted.

After removing the pulp from the lower left third molar—a procedure which in connection with bridge work I always follow—and filling the canal of the remaining root of the second molar, gold crowns were made, gold caps being made for the bicuspid and lower right central and lateral, using no pins. Thus a bridge was constructed for the entire left side of the mandible, extending to the lower right canine, using the saddle-back teeth for the bicuspid and for the molar dummy. Of course the lower right canine, bicuspid, and molars, and the upper left teeth were artistically treated before the impression for the bridge was taken.

The upper right first molar roots having now become quite firm, the bridge was made, and anchored to these roots, to the canine, and to the central of the same side, as shown in Figs. 7 and 8. It is not necessary to say that quantities of pus flowed from under the gum, and that it

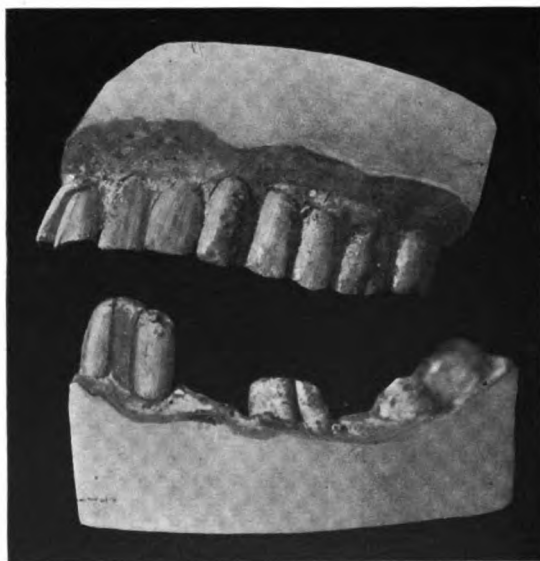
was in no way an encouraging case. It was treated as set forth in my paper, and the fifth month the case presented the appearance seen in Figs. 7 and 8, with not

FIG. 5.



Case II. Right side before treatment.

FIG. 6.

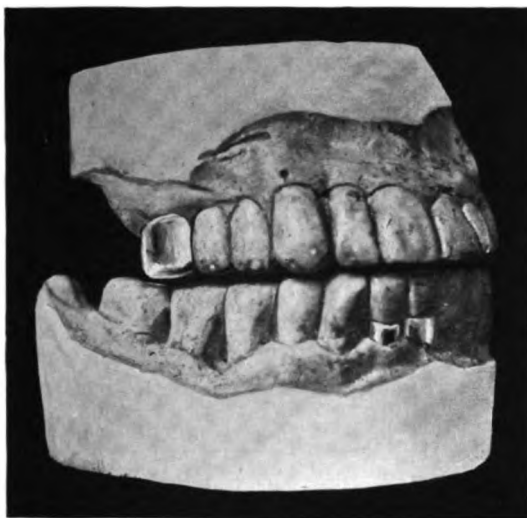


Case II. Left side before treatment.

the patient was at first instructed to take a single red spot on the gum. When seen again, about sixty days afterward, the a full dose of calomel. At the end of

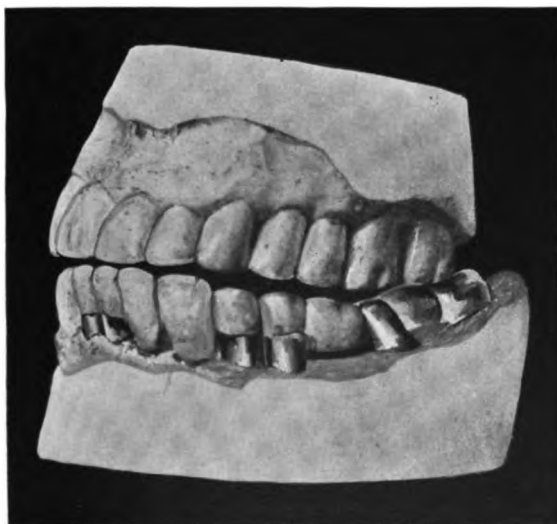
patient had regained her health and increased her weight about twenty-three pounds. About six years have elapsed since the treatment of this case was terminated. I saw the case again, however, about two months ago, and both the

FIG. 7.



Case II. Right side after treatment.

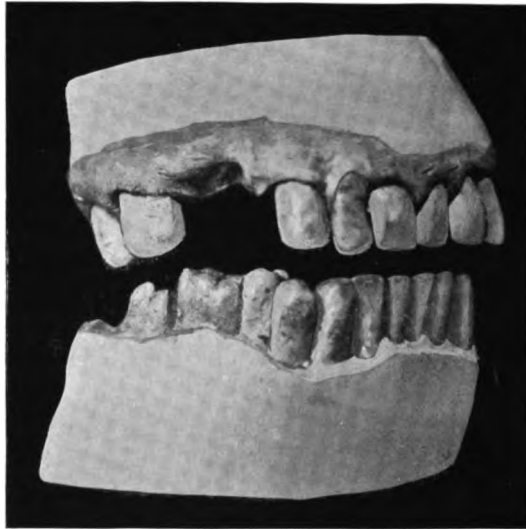
FIG. 8.



Case II. Left side after treatment.

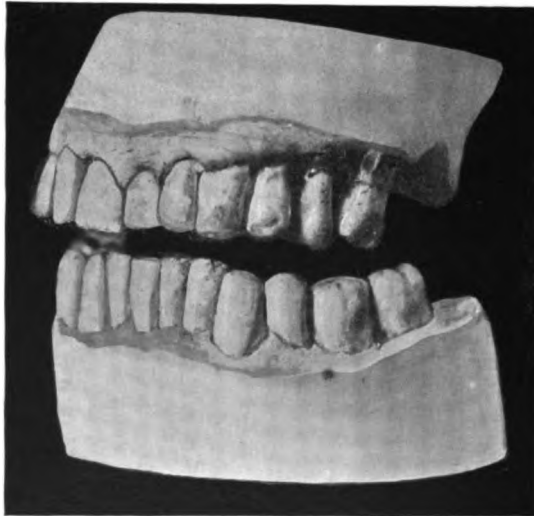
pounds. About six years have elapsed since the treatment of this case was terminated. I saw the case again, however, about two months ago, and both the mouth and the general health seemed to be perfect.

FIG. 9.



Case III. Right side before treatment.

FIG. 10.



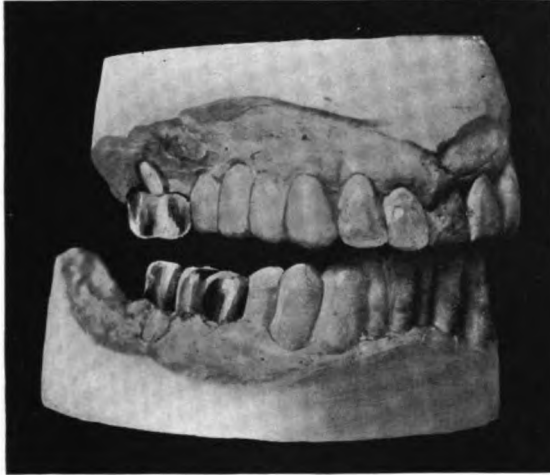
Case III. Left side before treatment.

CASE III.

Figs. 9 and 10. I found this case apparently hopeless, and it had been so pronounced by a specialist in pyorrhea. The teeth seemed to have almost no attachment to their sockets. The upper centrals.

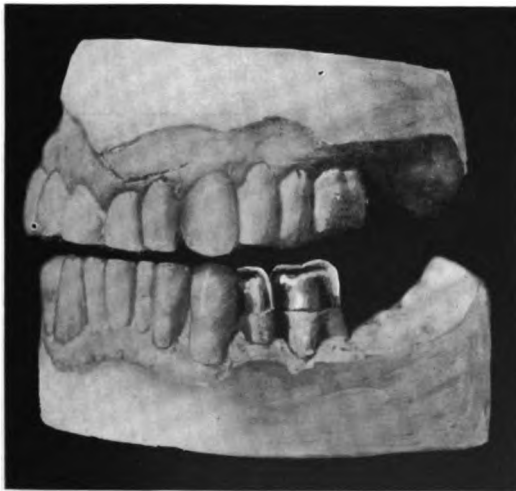
however, were comparatively firm for a any of her teeth at all. She had swollen mouth in this condition. The patient, allowed such an amount of pus that her

FIG. 11.



Case III. Right side after treatment.

FIG. 12.



Case III. Left side after treatment.

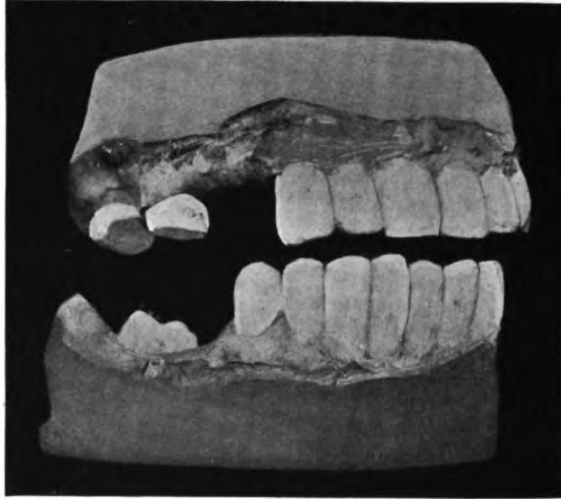
maiden lady aged forty-six, was in poor general health, and in every way the outlook was most discouraging for saving

[VOL. XLIX.—20]

face was of the same color as the pus. Upon a thorough examination it was considered useless to try to save the upper

left first bicuspid and first molar. The was made to save the right first and the other molars of the jaw had long since left second molar. After the surgical

FIG. 13.



Case IV. Right side before treatment

FIG. 14.



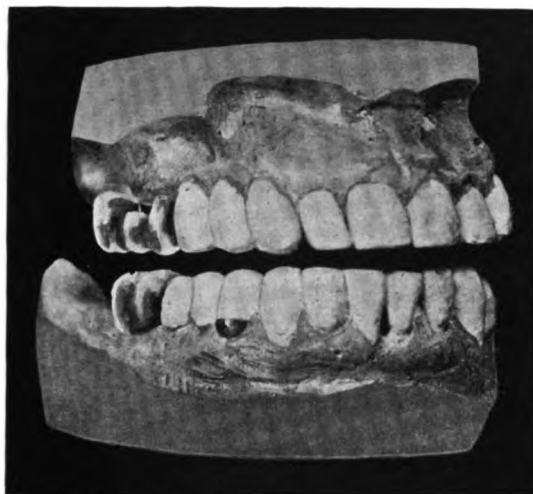
Case IV. Left side before treatment.

dropped out, as well as the upper right bicuspid and first molar. So loose were the teeth of the lower jaw that no attempt

treatment and general directions as to living had been given, the patient was sent to the mountains for two months.

On her return, I was delighted to find the root of the second molar was by this time wholly unattached, and the distal

FIG. 15.



Case IV. Right side after treatment.

FIG. 16.



Case IV. Left side after treatment.

mouth astonishingly tight, except the upper right second and third molars, which were still very loose. The mesio-buccal

root was attached only on the lingual side, the attachment fortunately extending to and including the apex of the root.

As clearly shown by Figs. 11 and 12, the mesio-buccal and distal surfaces were entirely exposed, save the apex itself. After filling the canals of the roots the mesial root was amputated at the bifurcation, and though the distal root was greatly exposed, the two remaining roots of this molar, as well as those of the third molar—which was greatly involved, with practically no bone left on the mesial surface—very soon became sufficiently tight to justify bridging along with the canine and lateral. For the left side of the maxilla a bridge was made, anchored to the lateral incisor, canine, and second bicuspid roots, with a porcelain-faced dummy molar extension, the mesial half of the occlusal surface striking the distal half of the gold crown below, this crown being united to a gold crown on the first bicuspid, the second bicuspid having been lost early in life. On the right side of the mandible was constructed a small gold bridge of three teeth, uniting the second bicuspid and second molar to a small gold dummy filling the space of the extracted first molar.

Referring to Figs. 11 and 12, it will be seen that these gold bands were made very short, so as not to cover the bifurcations of the roots of the molars; for after the gums had regained their health there was an unusual exposure of all the roots in the entire lower jaw.

Having artistically treated the lower anterior teeth and the two upper centrals, the case was dismissed. In two or three months the patient was greatly restored in health, and had gained twenty-five pounds in weight. This was four years ago, and when last seen, about eighteen months ago, the mouth was in excellent condition, the teeth much tightened, and there was no redness of the gums whatever.

CASE IV.

Figs. 13 and 14. This case shows great loss in the number of teeth, as well as considerable loss of the alveolar process, especially in the left side of the upper and lower jaws. The upper right first and third molars, the lower right second

molar and first bicuspid were very loose. These teeth were disarticulated, except the bicuspid, and as no attachment was found of the palatal root of the upper right first molar and the distal root of the lower second molar, the teeth were split, and the roots were removed before an impression was taken. The left third molars were also loose; indeed, she had been advised to have all the remaining posterior teeth extracted and plates made to carry the artificial substitutes. The lower six anterior teeth were found loose, the central incisors being almost ready to fall from their sockets. These were immediately disarticulated, and after the surgical and therapeutic treatment began to tighten. The mesial root of the lower right second molar, I think, was the most hopeless case I have ever saved. There was absolutely no attachment whatever, except on the mesial surface, and as it had leaned forward so much it appeared as though lying on its belly, thereby allowing an instrument to pass over the end of the root without the least resistance.

Soon after the removal of the distal root, however, it straightened up in its position astonishingly, after a time becoming quite firm, and joined the bicuspid in supporting a very substantial bridge, opposing the bridge of the upper jaw supported by the canine, buccal roots of the first molar, and the third molar, as clearly seen at Figs. 15 and 16. The upper front teeth were in comparative health though loose, and there was practically no waste of the alveoli. There was some waste on the mesial surface of the upper left third molar. The lower left molar was very different, there being much waste of bone, involving both the mesial and lingual sides and extending almost to the end of the mesial root. The root-canals of these molars having been filled, as well as those of the canines, unusually long bridges were made to restore the extensive loss, as may be seen in Figs. 15 and 16.

The patient is a lady about forty-eight years of age, who had suffered for a long time from indigestion and rheumatism and was in a low state of health. She fell into my hands about two years ago.

After a year, more or less, of irregular treatment, we reached the condition shown in Figs. 15 and 16. I have seen her a number of times within the past

CASE V.

Figs. 17 and 18 show the condition of the lower teeth of a patient under treatment.

FIG. 17.



Case V. Lower right side after treatment.

FIG. 18.



Case V. Lower left side after treatment.

FIG. 19.



year, and upon the occasion of each visit I am forced to stand a good round scolding—not for her good health, but on account of an increase in weight of thirty-five pounds.

Fig. 19 shows one of those splints referred to in my paper, which was worn in the early part of 1897 for six months to support two upper centrals. Those two teeth are now in excellent condition.

**REPORT OF A CASE OF EXTENSIVE INJURY TO THE BONES OF
THE FACE, AND OF A CASE OF POST-TYPHOID OSTEO-
MYELITIS OF THE MANDIBLE.**

By P. FIASCHI, M.D., D.D.S., New York, N. Y.

(Read at the meeting of the First District Dental Society of the State of New York,
March 18, 1906.)

CASE I. The history of this case briefly is as follows: E. K., age thirty-five years, elevator machinist, was admitted to the service of Dr. Francis Markoe at the New York Hospital, November 8, 1902. It appears that while repairing an elevator in a building in the downtown section of the city, through some misunderstanding of the directions given to the elevator operator, the patient, who had his head and part of his shoulders projecting through a small window in the wall of the elevator shaft—past which the counterbalance, weighing 1500 lbs., ascended and descended—was struck by the descending counterbalance in the occipital region as he was looking downward. His head was carried downward and forcibly compressed against the brick wall of the shaft, in a space which certainly did not correspond with the occipito-mental diameter. He was held with his head pinned in by the counterbalance for about a space of twenty seconds as it came to a stop just below the level of the window when the elevator had stopped at one of the floors. The elevator going down, and the counterbalance going up, allowed the head to be released and the shoulders to be carried backward out through the small window.

On admission, examination showed the whole front of the face below the nasal process of the frontal bone down to the lower border of the mandible to be crushed, lacerated, and displaced backward for a distance of one inch. Both malar bones and both nasal bones were movable and were crushed backward; the

maxillæ were movable on the adjacent bones and on each other; and in addition there was a fracture of the hard palate, passing backward from the anterior teeth slightly to the left of the median line, including a fracture of the horizontal plates of the palate bones. The left maxilla was displaced downward five eighths of an inch; the left lower orbital ridge was broken and entirely loose. The patient also presented a compound fracture of the external angular process of the left frontal bone, and a compound fracture of the mandible between the right central and lateral incisors. There was a lacerated wound extending from the inner canthus of the left eye outward, about one and one-quarter inches in length, and the left eyeball sagged downward three-quarters of an inch, besides a lacerated wound of the upper lip through which two fingers could be passed into the mouth.

The left ala of the nose was torn free from the cheek; there were also lacerated wounds of the supra-orbital region and lower lip. The upper right central and lateral incisors and the two lower central incisors were missing. There was also bleeding from both ears, pointing to a fracture of the base of the cranium, and numerous contusions were noted over the back of the head and neck.

There was no paralysis; the pulse was slow and full, and the patient unable to articulate; there was considerable hemorrhage, and the man was in profound shock.

An operation was performed by Dr. Markoe shortly after admission. The face was washed, the left posterior nares

was plugged, and traction was made thereon to draw the bones forward. The wound under the left eye drained into the nares. The mouth, nares, and eyes were thoroughly irrigated with salt solution, and some fragments of the ethmoid bone were removed from inside the nose. A rubber tube wound around with plain

the hospital November 26, 1902, in an improved condition. The double-arch splint was worn for three and a half weeks, when good consolidation of all the bones except of the fragments of the mandible had occurred. A cap splint was made and cemented on to the mandible. He wore this splint for four weeks

FIG. 1.

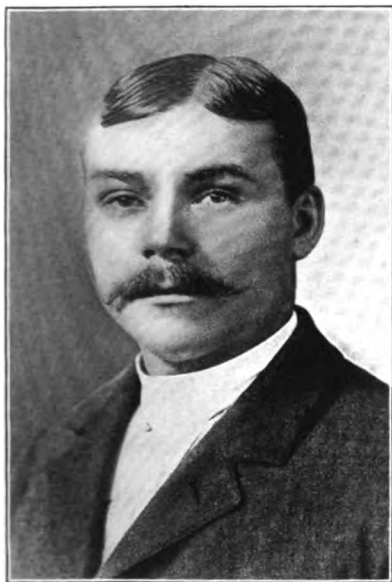


FIG. 2.



gauze was placed in each nostril and dry dressings were applied.

The patient was seen not long afterward, and on account of the pain, the extent of his injuries, and his poor condition, he was put under chloroform anesthesia, in order that the cheeks might be widely retracted and impressions be taken of the upper and lower jaws. From these impressions casts were obtained, and a rubber splint was made *secundum artem*, bringing the bite close together and embracing the teeth of both jaws. This was adjusted the following day and a traction apparatus passing around the vertex and chin was applied so as to draw the fractured bones well up in place, especially the prolapsed left maxilla.

He was delirious, off and on, for a few days following the accident, but left

longer, during which time a solid bony union had formed and articulation was restored.

On account of the fracture of the hard palate, a spicule of bone sloughed out of the line of fracture, from about the center of that line, between the fourth and fifth week after the injury. This loss of osseous substance left an elliptic communication between the left nasal fossa and the mouth, which channel is now about five-eighths of an inch anteroposteriorly and almost a quarter of an inch across its widest diameter. To cover this defect a rubber plate was made, which he has since continued to wear.

Fig. 1 is a photograph of the patient taken some time before the accident, and Fig. 2 is another taken five months after it.

Dr. John S. Marshall, in his well-known monograph, has collected nineteen cases of fracture of the maxillæ and upper bones of the face, from the literature on the subject and from his own observation. He estimates that twenty-five per cent. of all recorded cases of fracture of the upper bones would come under this class of injury. Almost every one of the cases of fracture of the maxillæ I have seen in this city were received in elevator accidents.

I am indebted to Dr. Markoe for the data which have made possible the preparation of this report.

POST-TYPHOID OSTEOMYELITIS OF THE MANDIBLE.

Case II. The mandible is rarely involved in the bone lesions which may follow typhoid fever, as compared with the frequency in which the long pipe bones—such as the tibia, femur, ulna, and humerus—and the ribs are attacked. This may be readily seen in looking over the cases collected by Dr. W. W. Keen¹ of Philadelphia, as in the total number of cases collected by him (216) there are only two reported in which the mandible was affected; and furthermore, in the very large number of cases of typhoid fever carefully observed at the Johns Hopkins Hospital, in Baltimore, there is no mention, in the studies of Parsons² on post-typhoid bone lesions, of a case in which the mandible was involved.

The following case illustrates the pathologic condition under discussion:

D. G., age nine and one-half years, was admitted to the service of Dr. Frank Hartley at the New York Hospital, June 9, 1905, with the following history: He had enjoyed good health until March 1905, when he was taken ill with pneumonia, followed April 25, 1905, by typhoid fever. During the third or fourth week of the attack he began to experience pain in the posterior part of the left side of the mandible, between the last molar and the angle, which was followed by some swelling of the face externally over the site of the angle; this, however, soon diminished. The parents state that he

had no pain or trouble at this time with any of the posterior teeth. The physician, thinking that the trouble was of dental origin, had the last molar on the left side extracted, and then opened into a swollen area behind this tooth, from which a discharge of pus soon followed. A few days afterward the boy himself removed a portion of dead bone of about the size of a nickel from the suppurating cavity; after that the pain diminished, but the swelling increased.

A general examination of the patient showed a fairly well-nourished but rather anemic small boy; heart and lungs normal. The angle of the left side of the mandible was markedly swollen and slightly tender, and the mouth could be opened only about one inch. There is a tooth missing from the socket of the last molar, and considerable discharge of thick pus from a sinus located behind that tooth. A probe introduced into the sinus touched bare and roughened bone.

An operation was performed by Dr. Hartley, June 12, 1906. With the jaws widely separated by a suitable mouth-gag, the first molar on the left side of the mandible was extracted, and a number of necrotic pieces of bone were removed from the horizontal and descending rami, the cavity being thoroughly curetted and packed with iodoform gauze. An area of about one and one-eighth inches of the lower end of the descending ramus and of the posterior part of the horizontal ramus and angle was thus removed. On account of the removal of this amount of bone, the jaw naturally deviated at once to the left. To overcome this, a retaining appliance of rubber similar to a double-arch interdental splint was subsequently made, to hold the mandible in correct articulation with the maxilla and to secure a close bite.

The patient left the hospital June 24, 1906. Since then he has worn the retaining appliance for three and a half or four months about as diligently as this class of hospital cases may be expected to do; at that time he stopped wearing it, as he found that he had a good articulation and could use the mandible freely. On the following October the area re-

FIG. 3.



moved from the mandible was found to have been completely regenerated, and was firm and solid. The deviation of the median line of the mandible from that of the maxilla amounts to about one-half the width of the lower central incisor, whereas immediately after the operation it was almost three-quarters of an inch. An X-ray plate (Fig. 3) taken at this time shows the area of regenerated bone very plainly, and also a faint line across the descending ramus, where apparently calcification has not yet become complete. The interior of the mouth is healthy with the exception that the bone at the angle does not on bimanual palpation feel as thick as on the right side, there being in appearance no difference between the two sides. Bacteriologic ex-

amination for the bacillus of Eberth was negative.

I would call your attention to the exceedingly fine result Dr. Hartley has obtained in operating on the case from within the mouth, whereas in hospitals, cases of this class are generally treated by incision and scraping from the outside.

This is the second case of this kind following typhoid that I have seen; the other, which I observed some two years ago, involved the symphysis, but not the whole depth of the bone at that point.

Works consulted: (1) KEEN, W. W. "Surgical Complications of Typhoid Fever." (2) PARSONS, H. C. "Johns Hopkins Hospital Reports," vol. v, 1895.

FORCING ERUPTION: A CASE IN PRACTICE.

By H. HERBERT JOHNSON, D.D.S., Macon, Ga.

(Read before Section II of the National Dental Association, Atlanta, Ga., September 18, 1906.)

IT having occurred to me that there might be enough features of novelty connected with the management of this little case to bring out some points in the treatment of irregularity, I have decided to present it in this short illustrated account. The case consists of one of these slight complications of dentition, often produced by the disobedient neglect of patients. This young lady, having no other immediate trouble to force her to pay the usual visit to the dentist, neglected to come until the fifteenth year, when she made a visit for examination and advice.

On examination I found both deciduous canines in place and quite firm, and the most searching examination I could make did not reveal to a possible certainty the position or even presence of the permanent canines. Knowing that some day, perhaps right in the midst of

her young womanhood, these deciduous teeth would loosen and come out, I thought best to extract them at once. Before doing so, however, I decided to inform myself absolutely of the position and presence of the permanent teeth. I therefore had her go to Dr. Thos. P. Hinman, who very kindly made for me some beautifully plain skiagraph views, one of each side of the mouth.

The presence and position of the teeth were now perfectly revealed. The one on the right side was pointing straight for its position, and it was very evident that no trouble would be experienced with that one, as is shown in the skiagraph reproduced in Fig. 1. The one on the left, however, was not in the least assuring. This tooth was lying very flat on the palatal side of the ridge, its crown resting opposite the apex of the lateral incisor, and the end of the root

resting nearly opposite the apex of the first bicuspid, as will be seen by reference to the skiagraph, Fig. 2.

ence to Fig. 4 the conditions will be seen as they existed after waiting one year, when the permanent canine on the right

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4



The condition of the mouth immediately after extracting the deciduous canines is shown in Fig. 3, and by refer-

ence to Fig. 4 the conditions will be seen as they existed after waiting one year, when the permanent canine on the right

cut through and open up the tissues and force it down. I began by making a circular incision of about a half-inch in diameter directly over the crown, taking out a plug of gum tissue, and using the skiagraph as a guide. I then chiseled

platinum hook for fastening a rubber band.

The little appliance shown at Fig. 5 was then made and cemented into place on the first bicuspid and lateral incisor, making a kind of bar or bridge with a

FIG. 5.



FIG. 6.



away a thin plate of bone exposed by removing the gum tissue, and came directly to the crown of the tooth. The opening was then packed for a few days until the hemorrhage could be checked, when a small hole was drilled into the surface of the crown which presented upward—which when the tooth was righted became the disto-approximal surface. Into this hole was cemented a small iridio-

hook in the center, from which a rubber band could be stretched to the hook in the tooth. The result was entirely satisfactory. The tooth came down as promptly as it would have been safe for it to do, or as fast as it would have been possible, to avoid destroying the pulp. After getting it well down with the pulling appliance, the position of which may be seen by reference to Fig.

6, a rest was taken to allow nature to adjust matters awhile. in Figs. 7 and 8. The principal difficulty encountered was in keeping the wound

FIG. 7.

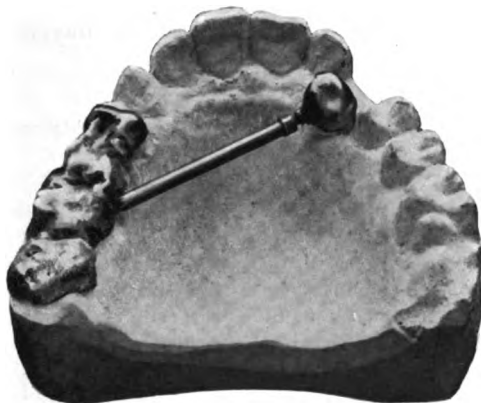


FIG. 8.



By means of a jackscrew, extending from and attached to the opposite bicuspids and molars, it was then pushed into its proper position in the arch, as is seen

from healing and closing up the opening, thus making it troublesome to adjust the little rubber bands, which had to be renewed quite often.

THE BANDED *VERSUS* THE BANDLESS CROWN.

By SAMUEL DOSKOW, D.D.S., White Haven, Pa.

(Read before the Luzerne and Lackawanna Dental Society, at Wilkes-Barre, Pa.,
May 15, 1906.)

THE subject of root-crowning has attracted the attention of the profession from its earliest history, resulting in a multiplicity of methods and conflict of opinions too numerous to mention. That inherent human characteristic—the individual's belief in his particular way—is a condition that always has obtained and probably always will. The spirit of this persistence is regrettable as a factor in impeding progress and lowering the dignity of discourse. One truth, however, is made apparent by this crown controversy, in that, in this conflict of opinions, the absence of a scientific standard of measurement is still clearly apparent. The monthly review of methods or modifications of details all show a dickering with a superstructure based upon the original principle—which is probably wrong, and therefore susceptible of indifferent refinement.

Beginning with the pivot teeth of Fauchard and Dubois de Chemant, the wooden pivot teeth, and the crowns of Richmond, Bonwill, Logan, Downey, and Davis, we can trace distinct phases in development. The apparent faults of one were overcome in the other, and so on down the whole line, each according to his ingenuity and skill in production.

While some general methods were thus evolved that are applicable in a majority of cases, yet strictly speaking, no one method in vogue is applicable in every case, either because of some fault in the principle underlying it, or through the lack of ability in the average practitioner to produce that which nothing but the highest skill is capable of accomplishing. It is readily seen, therefore, that

something different from the methods practiced at present is needed, in order that one method applied with the average skill may answer for every case.

It is interesting to note the different attitudes taken by the leading dentists in regard to this subject, the more so since the entire profession is divided into different camps on this point in particular, consciously or unconsciously following the lead of one or the other. For instance, Dr. Walter H. Neal (*Dental Brief*, October 1901) makes a radical and thorough sweeping statement against the use of the band around the root in the making of crowns. His denunciation of this method is so sharp and bitter that in no place could he find any use for it. Much in the same line, but not so poignant a criticism, comes from Dr. H. C. Register (*International Dental Journal*, February 1902) who says that there are many, if not more, roots destroyed by this method of crowning than are saved by it, because of the production of irritation which induces gingivitis, leading to pericementitis and other ills that follow irritation of the pericementum, and that the band should be used with extreme care and only in exceptional cases. Dr. Joseph Head (*DENTAL COSMOS*, July 1904) finds cause from quite another standpoint for advising against the use of bands. He claims, and in this he has my hearty approval, that theoretically it is possible to fit a band around a root and make it perfectly smooth with the contour of the root, but is that the case in practice? And if in practice it is not possible, then every band is a source of infection. Nevertheless, in the cases of

split roots, he admits that it fills a want that can hardly be filled by any other device.

On the other hand, Dr. Hart J. Goslee (DENTAL COSMOS, January 1901) writes: "As the result of experience a great majority of the profession now agree that a crown with a band encompassing the end of the root is essential to permanence, because of the immunity from the penetration of secretions into the joint, the protection to the root from subsequent decay or fracture thus afforded, and the increased stability. Hence it seems needless to more than mention with emphasis that a perfect-fitting band is the first essential."

Dr. F. H. Metcalf (*Pacific Dental Gazette*) while favoring the bandless crown, yet holds that for strength and durability the banded crown still leads, and claims that with the careful operator it is to be preferred in all cases. And from what I can recall of the teachings of Dr. F. A. Peeso, I gather that every root that is worth crowning at all should have a band around it.

From the data thus quoted, it is no wonder that not only the novice, but the average practitioner, is so bewildered that he does not know the exact course to pursue and is, as stated above, a follower of one camp or another. And yet both are not far from the truth, for if they were, the results obtained by both methods would be far from being as favorable as they really are. For in spite of all the objections to the banded crown, there are probably thousands of cases in which, although the band was employed indiscriminately, everything else having been equal, satisfactory results have followed its use. And on the other hand, especially within the last decade, just as large a number of manufactured crowns have been inserted, that have, from all reports, proved to be likewise satisfactory.

It would therefore be in place to consider the merits and demerits of the various crowns now in use, and to deduce from them a method that would possess all the requirements, viz, strength, durability, esthetic qualifications, ease of construction, and applicability to all cases.

To this end I shall refer to all the porcelain crowns on the market under the name of manufactured crowns, as there is not much difference between them, and also because they are familiar to all.

As above stated, the chief claim in favor of the banded crown is that it is more reliable and has a wider range of application. Let us now pass in review the open objections to this form of crown:

First: The proper mechanical fitting of a band around any shaped body is only possible where the sides of that body are parallel, or as in the case of a cone, where the fitting is done by forcing the band from the point toward the base. Neither of these conditions holds true in the case of a root. In the fitting of a band around the root in the mouth we have to do with the base of a cone, and the higher the band is carried along the root, the poorer is the fit.

Second: Even if a proper fit were practicable it would be impossible to tell when the band impinges upon the peridental membrane, causing irritation, resulting in pericementitis and the subsequent ills that may follow this disturbance.

Third: The thickness and width of the band that is usually employed, in order that it may effectively produce the results claimed for and demanded of it, are far in excess of the amount of tissue removed by the cleaving away of the enamel, thus necessarily acting as an irritant upon the gum. It is nothing uncommon to find that part of the gum immediately overlying the band congested, purplish blue, and puffy, in those cases where no appreciable recession has taken place, or else the gum so receded as to expose the free edge of the band.

Fourth: The floor of the cap can seldom be formed perfectly flat for the proper fitting of a facing against it, and in order to preserve its surface from checking during soldering. In forcing the post through the floor of the cap preparatory to soldering, a shallow depression is invariably formed that could be, but usually is not, covered by the ordinary method of backing. This depression forms a handy pocket for the trickling

down of borax, and is the cause of many checked and cracked facings.

In view of all these objections, it would seem advisable that the profession set to work to evolve a different method. On the other hand, we are supplied through the agency of the manufacturer with porcelain crowns under various names, but which in reality differ very little or not at all in principle. Let us look into the vulnerable points of these crowns:

(1) Bearing in mind the motto laid down by the late Professor Harris that "the base of the crown should touch every part of the extremity of the root," we are at once confronted by a serious objection to this form of crown. How many of us can say, in every case where a manufactured crown was employed, that absolute contact at all points of both surfaces was obtained.

(2) Granting for the sake of argument that perfect adaptation of the crown to the root is possible, its retention is not thereby strengthened. As is to be expected, the line of cement between crown and root is very thin—indeed, theoretically it is only of microscopic thickness—and soon dissolves out, thus providing a suitable and inviting space for the invasion of micro-organisms. Even if it should chance that the reaction of the secretions of the mouth is such that it will not have any deteriorating effect on the cement, no strength is added to the retention of the crown, for according to the experiments of Dr. Joseph Head (see DENTAL COSMOS, July 1905), the strength of cement is dependent upon its bulk.

(3) The pin and tooth united is as a lever. The fulcrum is the fixed base over which the lever works, resulting either in the splitting of the root if the pin be made of a stiff material such as German silver, or in the bending of the pin and the forcing of the crown labially, placing it out of alignment, if the pin be made of a soft material such as platinum. In addition a suitable pocket is formed for the lodgment of food débris, followed by the inevitable destruction of the root.

(4) The number of molds is not suffi-

cient to fit every case. All the crowns manufactured are made from standard—or what is adopted by the manufacturers as standard—molds. Very seldom can a crown be found to suit the case in hand. Time and again do we come across crowns—intended to replace missing incisors—that will be wider than the root mesio-distally and narrower labio-lingually, or *vice versa*; while as regards the appearance, nothing better could be desired.

(5) In cases of close bite, or where the natural teeth are very thin labio-palatally, it becomes necessary, in order to comply with the requirements of the bite, to grind away the crown on the palatal surface. The crown is thereby weakened in proportion to the thinness of the porcelain overlying the part of the pin embedded in its body—either baked or cemented in. The breaking of a majority of crowns could be traced to this cause.

(6) The disregard of the anatomical characteristics of the root and of the mechanical value of the pin is shown in those instances when the patient appears with the crown in his hand and the pin in the root. This is a frequent occurrence with the crown that has a threaded pin, which is screwed into the crown and fastened by cement. It usually breaks even, if the last thread is on a line with the cervical surface of the crown.

(7) The applicability of manufactured crowns is limited to sound roots, where the decay has not extended beyond the gingival margin. It is needless to say that the conservative dentist meets with very few cases that present this favorable condition, for wherever they are encountered the tooth could probably be saved without resorting to crowning.

(8) Although some attempt has been made by the manufacturers to furnish substitutes for teeth placed irregularly in the arch, and especially those cases of overlapping central and lateral incisors, we can safely say that they have not only fallen short of the mark, but have not even approached it sufficiently near to be entitled to the claim of an imitation. Those who have made an extensive use of these crowns will admit the total helplessness of such cases.

(9) Last, but not least, the slovenly effect upon dentists. The number of crowns met with in the mouths of patients where they extend beyond the periphery of the roots and act as irritants upon the gums, and the reverse case, where the roots extend beyond the margins of the crowns and thus are exposed to the action of micro-organisms, is so large that it is of sufficient cause to warrant the abandonment of their use.

In the spirit of compromise to the objections to both the Richmond and the manufactured porcelain crowns, another known as the "half-cap crown" was introduced by Prof. W. F. Litch and recently revived by Dr. R. M. Sanger (*DENTAL COSMOS*, August 1903). The advantages claimed for this form of crown are that it overcomes the chief objection to the Richmond, viz, the unsightliness of the exposure of the gold band in front, caused by the recession of the gum, and that it is stronger than a bandless crown in that a large part of the circumference of the root is encircled by a band. This argument is wrong both in theory and principle. The force of the bite is upward and outward, while the band covers only the palatal and parts of the approximal walls, thus not offering any resistance to the force of the bite. A common result is that with the continued force of the bite it is forced outward, carrying with it the band, and forming, as in the bandless crown, a favorable place for the development of caries.

Another claim made in its favor is that the band of enamel surrounding the root under the gum adds sufficient strength to the labial part of the root, so that a full band is uncalled for. I think that all will agree that the strength of the enamel, like that of porcelain, depends upon bulk; and that the amount left after the root is ground level with the gum is so little that it cannot be regarded as sufficiently strong to protect the root against splitting. The ease with which it yields to the cleaver is sufficient proof.

And again, even if it were sufficiently strong to fulfill all the claims made in its favor, the adjustment of a band to the palatal half of the root over the intact

enamel is a source of irritation to the gum and peridental membrane. Whether it is made according to the method advocated by Dr. Litch or according to that advocated by Dr. Sanger, it is bound to produce the same results as regards the gum and peridental membrane, and in addition forms a lump—bulky and cumbersome to the tongue—on the palatal surface, extending beyond the natural line of the teeth.

Another crown that was devised to fill the need is the Williams crown. It is made by forming a groove around the canal by means of a trephine, and fitting into it a ferrule that is furnished by the dental depots.

The fallacy of this principle is obvious. The root is materially weakened by the circular groove cut around the canal, so that instead of adding strength, which is the main requisite, the root is thereby rendered more apt to split. It is also necessary to bear in mind that roots are not round, and that it is not possible to apply a round trephine in all cases. The difficulty of applying a manufactured article to all cases in the mouth forms as valid an objection in this case as in the case of manufactured crowns.

It is with a feeling of gratitude toward its author that I have undertaken to present before you a crown devised by Dr. P. B. McCullough of Philadelphia. Although it was presented to the profession about five years ago, and has since been demonstrated before various dental conventions, I can safely say that it is still unknown to a large majority of the profession, and even were it not so, it would bear repetition because of its merit. As stated above it is a method that will answer for every case and requires no more than the average skill for its application; in this respect the McCullough, or as he terms it, "the burnished cap crown," fully comes up to the standard.

The chief features of merit in this method are that the entire work is done on a cast made from oxyphosphate cement, the strain on the nervous system of the patient and the amount of pain inflicted are reduced to a minimum, and it contains all the virtues of a band-

less crown and the advantages of a banded crown.

The root is ground down by means of carborundum stones slightly below the gum margin, following the festoon of the gum, and the remaining enamel is cleaved off. The root is then beveled with a cone bur, thereby converting it into an inverted truncated cone. (Fig. 1.) Any instrument whose strength depends upon bulk, or that has to be used as a lever to form a bevel, is contra-indicated for that purpose. In the first place, it is difficult to insert it between the approximal spaces, and in the second place, an instrument that works on a fulcrum will never produce a straight-line bevel, but

FIG. 1.

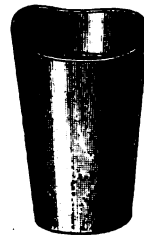


invariably one that is slightly curved. To overcome this difficulty the cone bur is used. It comes in various sizes, and is therefore easy of manipulation in all places. The approximal spaces as well as badly decayed roots that extend for some considerable distance beyond the gum margin can be reached with it and beveled, as easily as can the labial and palatal surfaces. The bleeding from the gums that usually accompanies all operations of this nature is easily checked by a stream of cold water from a syringe, which also cleans the part from the débris caused by the bur.

An impression tube, funnel-shaped, is made from a thin piece of German silver cut in the shape of a keystone, the edges of which are bent together and soldered with silver solder. By means of pliers and shears, it is made to fit loosely around the bevel and under the gums. It is then

filled with wax to within one-quarter inch of its wide surface. (Fig. 2.) Any cheap quick-setting cement is then mixed to a medium consistence, placed in the

FIG. 2.

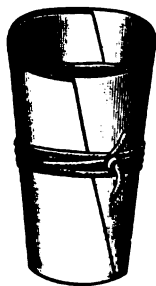


tube, and pressed against the face and bevel of the root. The tube is held between the thumb and the first and middle fingers, the other fingers resting against the adjoining teeth or the roof of the mouth so as to keep the tube in balance.

An impression of the root and bevel thus taken, a facsimile of the root in cement is the next desired step. As a separating medium, the soaking of the impression for about ten minutes in formalin or the coating of its surface with glycerin can be employed. The glycerin works better in my hands, and is therefore always used. As the outer edge of the bevel is usually on a line with the edge of the impression tube, in order that a cast of a suitable size may be obtained, it is necessary to form a matrix around the impression. This is accomplished by holding the tube in the corner of a piece of paper about the size of a prescription blank, and rolling until it is well wrapped. A wax thread is wound around the paper tube to hold it in place. The matrix is then trimmed to within a quarter of an inch of the impression (Fig. 3), and the surface of the impression is moistened with glycerin. Any cement, such as Weston's or Climax, is mixed to a thick consistence and packed into it. It is then held under pressure between thumb and finger for about ten minutes to prevent it from warping. When the cement has set, the matrix is removed, and the cast and impression are separated by pulling them apart.

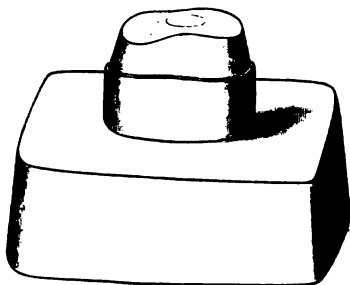
The excess cement is cut away with a coarse stone, care being taken not to grind beyond the upper edge of the bevel. For the sake of convenience in handling,

FIG. 3.



the cast is mounted on a block of plaster or wood and fastened with hard wax. (Fig. 4.)

FIG. 4.



A piece of inlay platinum of suitable size is placed over the cast, held firmly

FIG. 5.



by the thumb of the left hand, and with a large burnisher the edges are burnished down the bevel and beyond it. This forms

a fairly fitting cap to cover the end of the root. (Fig. 5.) It is now laid aside, and a strip of 22-k. gold, No. 30 gage and about one-eighth inch in width, with angular ends, is measured loosely around the outer edge of the bevel. The ends are soldered together with 22-k. solder, and the band thus formed is shaped by pressing it over the cast. In thus shaping the band, it is always necessary to bear in mind that its walls should be parallel with a line drawn vertically through the center of the cast. The band is then removed, the cap annealed, placed on the cast, and the band pressed into place

FIG. 6.



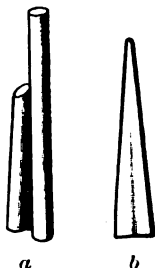
over the cap, drawing it tight over the cast. The cap and band are then removed and soldered together with 22-k. solder, freely covering the cap with solder from the surface to which the porcelain is to be attached. The overhanging edges of the platinum are then trimmed even with the outer edge of the bevel, and the outside of the band beveled toward the roots. This makes the band perfectly smooth with the contour of the root, and overcomes some of the objections to the banded crown, and in addition restores the amount of tissue removed in preparation. (Fig. 6.)

The pin is formed by filing flat at an angle a round piece of iridio-platinum wire No. 18, about two-thirds the length of the canal, and soldering its flat surface with 22-k. gold to another piece of the same thickness, about one and one-half times its length. (Fig. 7, *a*.) It is then filed flat into the shape of an obelisk. (Fig. 7, *b*.) It could also be made from two wedge-shaped pieces of clasp metal soldered together. Thus a pin is formed that will be strongest in the direction of greatest force, and will be equidistant from the periphery of the root. A hole is then punched in the center of the cap and enlarged by means of a bur to admit

one-half the length of the pin. This is done so as to prevent the turning up of the edges when the pin is forced into place.

At the next visit of the patient the cap is placed over the root and—assuming that the canal has been previously enlarged—the pin is forced through the

FIG. 7.



hole in the center of the cap into the canal as far as it will go. By slightly pulling on the cap with thumb and first finger, the cap and pin can be removed together and soldered with 22-k. solder. This is best accomplished by resting the cap over two pieces of charcoal, fire-clay, or pumice, with the pin suspended between them, or by previously drilling a hole in the asbestos block sufficiently wide and deep to admit of the free suspension of the pin without any tendency to dislodge it, the edges of the cap resting on the block.

The pin being soldered fast, and providing a hold for the fingers, the cap is held against the flat surface of the lathe stone, and the band extending beyond the cap is ground flat at the angle that will be narrowest labially and widest palatally. It can usually be ground so that labially the band will be cut away beyond the inner edge of the bevel, thus insuring the absolute covering of the gold by the gum, and overcoming another valid objection to the banded crown. (Fig. 8.) It also—in the least amount of time—forms a flat surface against which a porcelain facing can be ground to fit accurately.

The section thus completed is placed upon the root, an impression taken, casts made, and the bite taken in the

usual way. A facing of the proper mold and shade is selected and ground into place, and attached by means of hard wax. It is now removed from the cast, and lines are drawn with a sharp knife on the walls of the cap in line with the flat surface of the facing. To facilitate the removal of the cap and pin from the cast, it is well, prior to the pouring of the cast, to cover the pin with a thin layer of wax. On heating the cast

FIG. 8.



slightly prior to the attachment of the facing, the wax is softened, and the cap can be easily lifted from its place without disturbing the relationship of the facing and cap.

The next step is the formation of a backing. For this purpose 32-gage platinum is used. It is made to extend at least one-sixteenth of an inch around the free edges of the tooth, and is swaged against the facing by striking a soft wooden stick placed on the labial surface of the facing with a light horn mallet into moldine. This outlines the margins of the facing distinctly, and protects it on all the free edges against coming in contact with the flux during the process of soldering. The remaining edge of the backing is cut flush with the ground surface of the facing. For the protection of this surface, crown metal—gold on one side and platinum on the other—rolled to a thickness of 0.001 in. is used. The backing is removed from the facing, and placed on the soldering block, with the surface that comes into contact with the porcelain downward. A piece of crown metal of suitable size is placed over it about one-sixteenth inch below the upper margin of the backing, gold side downward. With the blowpipe the gold of the crown metal is made to melt, soldering the metal to the backing. It is then returned to the facing, and with the finger, the crown metal is bent over the ground surface of the facing,

the free edges extending beyond its labial surface. Another advantage gained by the addition of the crown metal is that the gold surface coming in contact with the ground surface of the facing lends to it a yellowish tinge, which at that part of the facing is very desirable. To insure against the probable leak of flux around the pins, in case the holes punched in the backing for their admittance are slightly larger than the thickness of the pins, small washers made of 36-gage pure gold and punched out with a sharp-pointed instrument are slipped over them. The washers are carefully burnished down with an instrument provided for that purpose. (Fig. 9.)

FIG. 9.



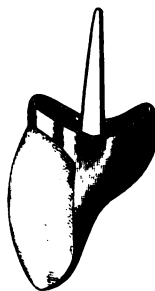
The immediately adjoining teeth in the cast are now partially cut away to allow for the extension of the edges of the backing beyond the margins of the facing. With the lines on the sides of the cap as guides, the facing is waxed into place. It is then removed from the cast and invested. When hardened, the wax is washed out with a stream of boiling water. Small pieces of solder covered with borax are placed at the points of contact of the crown metal and the cap. A few pieces of platinum or clasp metal are placed at the various points in order to draw the solder for the reproduction of the anatomical contour, over which large pieces of solder are placed. The investment is heated up in the usual way, the heat being applied to the under surface of the investment immediately beneath the joint of the facing and the cap, until the small pieces of solder placed at that point melt and flow down, when the

flame can be applied on the surface to facilitate the flow of the solder, and the covering with it of the entire surface of the backing. If these precautions are carried out, a most perfect joint between the facing and the cap will be obtained, and checking of the facing, even of microscopical character, will be avoided.

The incisal edge of the facings to be selected in this work should be of the knife-edge order. When the contour is properly restored with solder, the danger of snapping off a facing during mastication is reduced to a minimum, as the opposing teeth always come in contact with the gold first, and with no unsightly showing of gold at that point.

The excess of platinum and solder is cut away with a stone. The grinding should be done against the facing, as it tends to the production of an absolutely fine joint. It is then finished in the usual way. (Fig. 10.)

FIG. 10.



In favorable cases, or where the dentist is a porcelain enthusiast, an all-porcelain crown can be constructed on this principle. The cap is made in the way already described. A detachable-pin porcelain crown of the proper shade and mold is selected and ground flat to fit the flat surface of the cap. The detached pin is cut, the part belonging to the crown is replaced in the space provided for it in the crown, and filed flat with the base of the crown. A small piece of hard wax is placed on the pin, the cap is heated, and the crown placed on it. In a minute the crown is removed from the pin. The latter, waxed in place to the cap, is removed with it from the cast, in-

vested, and soldered. The crown is then fastened to the pin and cap with cement.

FIG. 11.



When set it is ground wherever necessary in order that it may fit flush with the cap. (Fig. 11.)

In cases of edge-to-edge bites we have observed that a porcelain crown attached to a cap will in some instances hold better than a soldered crown. A case that came to my notice about a year ago illustrated this fact plainly. Both upper central incisors were replaced with crowns by different dentists. One was a Richmond crown, and the other a porcelain crown attached to a Richmond cap. The latter did good service for about five years, while the former only lasted one year. While one case is not sufficient data for conclusive purposes, yet it is worth bearing in mind and comparing it with other cases that may be heard of from time to time.

A NEW METHOD OF OBTAINING PLASTER IMPRESSIONS IN DIFFICULT CASES.

By R. MACDONALD, D.D.S. Univ. Pa., Brisbane, Australia.

THE difficulty attending the obtaining of plaster impressions is in ordinary cases overcome by the use of perfectly fitting cups and good impression plaster; but certain cases, which come regularly, cause the most skilful operator to hesitate as to the propriety and expediency of using plaster. I refer to those patients well on in life whose teeth are extremely elongated and somewhat irregular, some of them with a slight tendency to looseness, but not sufficiently so to warrant extraction.

As to the particular material to use in these and all other cases, I presume that there can be no question as to the incomparable superiority of plaster. The well-known method of oiling the cup, drawing it away from the impression in the mouth, and then breaking up the impression into sections or pieces and replacing in the cup, is to any others than the skilful a very difficult operation, and calculated in many patients to occasion considerable discomfort and alarm. The

chance of a dislodged piece of plaster getting back into the throat and larynx, as well as the general difficulty, often induces many operators in these specially difficult cases to resort to modeling compound or other inferior impression compounds.

I have recently in my practice had occasion to construct dentures for some cases of the nature mentioned, i.e. elderly people with very elongated irregular teeth, somewhat loose, and I have adopted a method which has given such good results that I respectfully beg to lay it before the readers of the Cosmos.

First I obtain a modeling compound impression, and run a plaster cast in the ordinary way. Having obtained this cast I build on it a thick wax plate as if for a bite, but which goes only about one-quarter up the height of the teeth from their cervical portion, and with a small knife trim away the wax where it embraces the teeth, so as to leave a clear space of say one-eighth inch around

all the teeth; then with an excavator the wax plate is scratched on its interior or palatal surface, and also on the cut-out portion encircling the teeth. The object of this scratching is to allow the impression plaster to attach itself. I then mix some S. S. White impression plaster in the ordinary way, put some all over the palatal surface of this specially improvised wax cup and insert it in the mouth. Some of the plaster is forced through the cut-away spaces of the wax around the teeth. A perfect plaster impression is thus obtained of the palate, alveolar ridge, and portions of the teeth. As the wax plate only goes up one-quarter the height of the natural teeth from the cervical edge, the impression ends there. It is easily withdrawn. Indeed, extra time may be given as regards the setting of the plaster, and only the slightest fracture of the plaster takes place even in the most difficult cases. A clear sharp plaster impression is thus obtained for the basis and foundation of the work. The impression after being withdrawn from the mouth is painted in the usual way, and a cast run, the palate, alveolar ridge, and one-quarter of the teeth from the cervical margin being reproduced.

In the event of its being a gold denture, this is all that is required for the sand castings, which are duly made, and the gold plate swaged. The swaged plate is now put in the mouth, and will be seen to go unerringly to its place, owing to the great accuracy of the plaster impression. A modeling compound impression is now taken with an ordinary cup, the gold plate being in its position in the mouth, and the cast is run from this. It is then set up on the articulator and the case is finished.

In the event of the denture being vulcanite throughout, I proceed as follows: Having obtained the plaster impression in the specially improvised wax cup, the cast is run in the ordinary way; the palate and alveolar ridge are thereby reproduced with all the teeth to one-quarter of their height from the cervical margin. In other words, a cast of the mouth is reproduced, except that the teeth are reproduced only to a height of say one-

quarter of an inch from their cervical margins—they appear as if they were cut off at that height above the gum.

Instead of making a swaged gold plate, rubber is run on and vulcanized, so as to produce a solid base about two or three times the thickness of an ordinary gold plate. This vulcanized base is now tried in the mouth, and owing to the perfect plaster impression, it will be seen to go exactly to its place, to be absolutely steady, and fit closely against the teeth. The case is then treated as the gold case was, the vulcanized base is put in the mouth, and a modeling compound impression taken with an ordinary impression cup. The cast is run in the usual way, then set up in the articulator and the case finished. The taking of the modeling compound impression is only an auxiliary, and subsidiary in importance, as the basis of the work has been secured by the first impression taken in plaster.

The undercut or overhang of the natural teeth will—especially where the vulcanized base is used—be modified, owing to the presence in the mouth of the vulcanized base-plate, which rises to one-quarter the height of the teeth, thereby doing away with some of the undercut. The tendency to distortion of the modeling compound will consequently be lessened; if, however, the modeling compound does catch, as is inevitable in these irregular cases under consideration, the distortion will in no way affect the base or foundation of the plate, which has been already exactly secured by the plaster impression.

There are one or two points which may be mentioned as regards the details of the work. The vulcanized base should be roughened by cuts on its external or lingual surface from the fret saw, so as to insure the attachment of the rubber used in the second vulcanization. Another point is, that before taking the plaster impression in the specially improvised wax cup, I put three little pellets of wax on different points of the interior or palatal surface of the wax cup—i.e. on the surface which is in contact with the palate—the object being to prevent too close contact of the wax plate

to the palate. In this way I insure a certain definite thickness of impression plaster. I have found it an advantage also to strengthen the specially improvised wax cup in lower cases by putting a thin sheet of modeling compound along its external surface.

In conclusion, I would state that I have tried this method in various cases during the last three months, and it has given absolutely satisfactory results. Its chief claim is that it simplifies and makes easy the obtaining of perfect plaster impressions for the basis and foundation of the

work in the most difficult cases. The use of this method also carries out a well-known principle mentioned in the "American Text-book of Prosthetic Dentistry," namely, that "the plaster covering the vault and arch should be of uniform thickness in order to insure the best results." An operator of ordinary ability can by this method obtain the most exact results in his work, and give a comfort and satisfaction to the patient which would be denied him were he to rely on any impression material other than plaster.

A METHOD OF REPAIR THAT CAN SUCCESSFULLY BE APPLIED TO SOME CASES OF FRACTURED BRIDGE OR CROWN FACINGS.

By HERBERT H. BETHEL, A.M., D.D.S., Philadelphia, Pa.

A CASE once presented itself in my practice in which circumstances rendered it inexpedient for me to remove a piece of bridge work in order that two bicuspid facings which had broken off might be repaired. The bite was such that it would not admit of any extra metal linguo-occlusally, and the backings were so thin that I could not hope to use such a method as Zentner's riveting or Bryant's screws and nuts.

I may say here that the facings had broken out on account of too thin a backing and exposure of the facings to a very heavy bite.

Realizing that I could not employ any of the usual methods, I thought out the following, which may be in use by many, although I had not before heard of it, and a claim to originality is of less moment than the usefulness of the idea:

I trimmed the old jagged backing and bent it with pliers until I had nothing more to fear from the bite. Then I straightened the pins, and filed the little heads up, so that they were of the same gage as the pin. Of course, in cases in

which the pins in soldering have been crystallized, and snap off in the porcelain, this method cannot be employed. The pins must be intact after the remaining chips of broken facing have been cleared away.

Now prepare to bake porcelain-inlay facings. A matrix is needed. This can be burnished directly on the bridge, or a dental lac or modeling compound impression taken and the matrix burnished to the model. I can suggest but two methods to obtain the holes in the porcelain facings so as to allow the new facing to fit down over the pins:

(1) Take platinum tubing that fits accurately over the pins. Cut off little pieces a trifle longer than the pins, and pinch this trifle in the pliers while the tube is still on the pin. This closes the one end of the tube. See that the tubes, two to each tooth, come readily away from the pins. Now burnish the foil—either No. 30 gold for low-fusing or 100% platinum for high-fusing body—to the old backing and the gum, allowing the pins to puncture it. When well bur-

nished replace the little tubes, and with yellow beeswax—as hard as it can be worked—remove the matrix and tubes together. Carefully, and without disturbing the position of the tube in the wax, slip steel pins one-fourth to three-eighths of an inch in length into the tubes and pour the impression with powdered asbestos 2 parts, plaster of Paris 1 part, engaging the protruding pin ends. The pins should be selected beforehand and should accurately fit the tubes. Coat with moistened whiting the end that goes in the tube. Dry the cast gently, remove the wax by dry heat and cotton fiber, and bake on the porcelain body in such a way as to avoid drawing the tubes awry, and contour carefully at the cervix.

(2) This method is similar to the first in the general method of procedure, except that instead of platinum tubes,

gold-wire pins a little heavier than the tooth-pins are baked in the new facing. These pins of pure gold are slipped into the wax impression through the punctures in the matrix, no tubes having been used in the procedure.

The pins are long enough to be held by the investing material, and are afterward cut off and with the engine bored out of the porcelain. As the gold is so soft, this can be readily accomplished. Set the facings with cement as carefully as for an inlay, roughening the pins, backings, and back of the facing. Protect well while the cement is setting.

If the bite is judiciously handled, the work will be successful, and although the account is somewhat lengthy, the method is really a very easy one to a man accustomed to working with porcelain.

THE BLUE LIGHT AND HEAT AS THERAPEUTIC AGENTS.

By A. W. HARLAN, M.D., D.D.S., New York, N. Y.

(Read before the National Dental Association, in general session, at its tenth annual meeting, Atlanta, Ga., September 16, 1906.)

FOR several years hints as to the usefulness of the blue light have appeared in our journals and the daily papers, without much thought as to its utility as a therapeutic agent. Many years ago, from the experiments of General Alfred Pleasanton, Mr. Gladstone, Prof. John W. Draper, Schellen, Pancoast, and others, some things were learned with reference to the action of the blue light on vegetation and fruit-growing, but not much was obtained relative to its action in inducing relaxation of the nervous system as a whole. It was found that in all cases of "excessively accelerated tension," much relief was experienced when the blue ray was used.

It remained for Professor Redard to demonstrate by this means a sort of anesthesia which would enable the operator

to extract a tooth or two after an exposure of the eyes to a blue ray through an electric lamp. This was done by using a sixteen-candle lamp, with a bright metal reflector, held at about four inches from the open eyes of the patient. The head and the lamp were covered with some dark blue cloth, and the room was darkened for about two or three minutes, when the anesthesia was sufficient to prevent pain in the extraction of two or more teeth.

After reading Professor Redard's article a little more than two years ago, I had a blue lamp installed; for some reason, however, it did not act perfectly well, so I used a reflector composed of a series of mirrors, which gave me much better results.

After a time I came to the conclusion

that I could improve upon this, so I had a lamp case constructed of tin, lined with a thin sheet of asbestos, and the outside and inside painted and varnished a dark blue. After the lamp was adjusted, I had a blue glass slide so that the light would pass through the lamp and the slide, making it more effective. It now works very well, and I hope that it will enable many of you to perform small operations on the teeth and gums painlessly, without using drugs. In all cases of pain in the jaws an exposure of from two to three minutes will arrest it for several hours. This is true also when it is applied to bruises and sprains, or lacerations. I have extracted several teeth, one at a time, with this improved lamp, and have removed deposits from the roots of teeth that were very sensitive before the exposure.

It may be that the series of mirrors will be an addition to the efficiency of this lamp, but I am not yet prepared to say that it is a necessity to obtain the best results.

THE BLUE LIGHT AND HEAT ON THE GUMS.

For more than two years I have used a small blue light on the gums for two purposes: The first is to cause a relaxation of the nervous tension; and the second, for the purpose of applying heat in connection with the blue light, so as to effect a double object—to prevent the development of organisms and to stimulate the tissues to a return to health. If the deposits are removed from the root of a tooth, and if they are carefully washed out of the pocket and around the gingival margin, this small blue lamp

may be held within one-half to one-quarter of an inch from the gum for from two to three minutes, when the operation is suspended until the next day.

After six daily exposures, I allow the patient to rest for a week, when upon a close examination, if the deposits are found to have been removed, I repeat the exposure for another six days and the case will be practically cured. Great care must be used not to burn the gum tissue. If it be found that all discharges of pus from the pockets have not been arrested by these exposures, I give another period of rest to the patient and repeat the exposure. During the treatments no medicines are used at all, but I thoroughly massage the gums, and the patient brushes the teeth, using a simple powder. There is no objection to the use of any of the non-irritating washes during the treatment.

The ancients were in the habit of using various colored lights in the treatment of diseases, but their systems fell into disrepute because they enveloped them with so much secrecy that only charlatans and impostors applied them. It was not until Finsen and Roentgen placed before the world their discoveries that a renewed interest was displayed in the utilization of various rays in the treatment of disease, as well as the diagnosis of obscure lesions.

These few observations are presented to you with the hope that operations around the roots of teeth and treatment of diseases of the gums may be much simplified, and that the dread of the chair may not deter so many persons from obtaining satisfactory dental service.

CORRESPONDENCE.

AN INSTANCE OF THE ENDOWMENT OF A DENTAL SCHOOL.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the discussion that followed Dr. Butler's paper on "The Educational Problem" [*Cosmos* for February, page 172], Dr. Brophy is reported to have asked this question [page 182]: "Tell me, gentlemen, if you can, where there is a dental institution in this world that has an endowment of a dollar?"

No one present at that meeting seemed able to name a dental school that had an endowment. I wish, therefore, through your columns to say that the Harvard Dental School has an endowment of twenty-six thousand dollars. Twenty

thousand of this sum was given by one man, and is known as the "Henry C. Warren endowment."

It occurs to me that the fact, if made known, may serve to help others interested in dental schools to obtain endowments. You will, I think, agree with me that it is only through the medium of large endowments for our dental schools that we can obtain the best in dental education.

Very truly yours,

EUGENE H. SMITH, *Dean,*
Harvard University Dental School.

BOSTON, February 11, 1907.

MIXTURE OF GASES IN OXYHYDROGEN BLOWPIPE.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The recent announcement in a scientific journal of a new oxyhydrogen blowpipe may be of interest to dentists. It is said that hitherto, in the oxyhydrogen blowpipe, a thorough mixture of the gases previous to combustion was not feasible, owing to the liability of the flames traveling back and causing an explosion in the mixing chamber.

The inventors (of the Société l'Oxyhydrique), knowing that the propagation of the flame in the tube is not instantaneous, but proceeds at a definite calculable rate, get over the explosion difficulty by making the mixed gases travel toward the flame orifice at a higher speed than the rate of the propagation backward within the tube. So long as this speed is

kept up, combustion proceeds only at the orifice, the flame cannot penetrate to the mixing chamber, and internal explosion is impossible.

On reading this, I naturally thought of the Rollo-Knapp blowpipe, which I used a great deal about twelve years ago. Here we have practically an oxyhydrogen blowpipe in which the gases certainly are effectively mixed in a chamber which is a foot or two away from the flame orifice.

A point of interest is, Did Dr. Knapp just miss the idea of applying the principle alluded to? That seems to be quite probable, as I remember well that one of our reasons for abandoning the use of the blowpipe was that the flame did occasionally "strike back" and cause an explosion, the pistol-like crack of which was

rather disconcerting, although it did no material damage to the instrument.

It is easy now to see that such explosions took place whenever the pressure of one or both of the gases fell below that required to produce the necessary speed of travel. But were the instructions given as to the use of the Knapp blow-pipe such as would lead one to believe

that its inventor knew the importance of the speed relation, the application of which we are told has recently been patented in all the chief countries?

Yours truly,

D. M. SHAW.

ROYAL DENTAL HOSPITAL, LEICESTER SQ.,
LONDON, W. C., July 24, 1906.

DENTAL INSTRUMENTS INCLUDED IN SURGICAL EQUIPMENT OF RUSSIAN WARSHIPS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—It is an item of special interest to note that in the "Report on the Russian Medical and Sanitary Features of the Russo-Jap War," by Surgeon Raymond Spear, U. S. N., it appears (see page 77) that according to his observations in Manchuria the instruments supplied to the Russian ships included in his report consisted of a general operating case and a dental case. No special eye,

ear, throat, or nose instrument cases were allowed. With the instruments on board, however, almost any ordinary operation could be performed.

This report was upon Russian ships in the harbor at Vladivostok that saw service during the war.

Yours truly,

WM. C. FISHER.

NEW YORK, November 26, 1906.

FORMALIN AND TRICRESOL FOR PUTRESCENT PULPS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I can add my favorable expressions to those of Dr. C. L. Rion (Cosmos, February issue, page 158) in relation to the use of formalin and tricresol. In fact, I consider it a specific in such cases. I have used the remedy for about two years, and cannot recall any number of cases that did not respond to this treatment.

I have applied it to teeth containing badly putresced pulps accompanied by pericementitis; and although it is contraindicated to hermetically seal such cavities with any other drug, I have done so with this combination and obtained excellent results.

Yours truly,

M. J. ORTMAN.

NEW YORK, N. Y., February 7, 1907.

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Meeting, Atlanta, Ga., September 18-21, 1906.

General Sessions.

(Continued from page 185.)

TUESDAY—*First Session.* (Continued.)

THE subject of Dr. Butler's paper was passed, and the next order of business was the report of the Executive Council, by the chairman, Dr. BURKHART, as follows:

The Council recommends that a resolution which was submitted to them by the delegates to the International Dental Federation representing this association, to the effect that an invitation be extended to the International Dental Federation to meet in the United States in 1908, be adopted, and that we extend to the Federation an invitation to meet here at that time, and that the officers of this association be instructed to formulate that invitation in due form. The Council also recommends that the usual appropriation of fifty dollars be made to the International Dental Federation.

We also wish to report that the chairman of the Committee on Journal, Dr. Kimball, has made a report to the Council, and that this matter, together with the president's recommendations, will be presented to the Council this afternoon by a special committee.

We also wish to report that the resignations of Dr. A. L. Northrop of New York city and Dr. W. P. Dickinson of Minneapolis, Minn., have been accepted.

The report of the Council was on motion adopted.

Dr. C. N. Johnson, a member of the Executive Committee, being absent, the President appointed in his stead Dr. C. M. Work of Ottumwa, Iowa.

The general session then adjourned until 7.30 P.M.

TUESDAY—*Second Session.*

The second general session was called to order by the president, Dr. M. F. Finley, at 8 o'clock Tuesday evening, September 18th.

The Executive Council, through its chairman, Dr. BURKHART, reported as follows:

The Executive Council reports that at its meeting this afternoon reports were received from the delegates of the association to the International Dental Federation, which report was referred to the Publication Committee to be printed in the Transactions.

The Council also reports that in deference to the wishes of a very considerable number of the members of the association, who have felt that the election of officers was held at a time when many could not be present, and for the purpose of giving all an opportunity to express themselves, we recommend the suspension of the rules, and that the election be held tomorrow, Wednesday, at one o'clock.

On motion the report of the Council was adopted.

The general session then adjourned until Wednesday at 1 o'clock.

WEDNESDAY—*Third Session.*

The third general session was called to order on Wednesday morning Septem-

ber 19th, at 12 o'clock, by the president, Dr. M. F. Finley.

The first order of business was the reading of a paper by Dr. A. W. HARLAN, New York, on "The Blue Light and Heat as Therapeutic Agents."

[This paper is printed in full at page 281 of the present issue of the COSMOS.]

Discussion.

Dr. GORDON WHITE, Nashville, Tenn. We all know that the Roentgen ray has been used very extensively and successfully in lupus; and we know, or rather we are supposed to understand, that many cases have been cured in that way. That the various rays have therapeutic power is perhaps not questioned. It is, however, a question in my mind whether the law of suggestion does not play a part in the production of anesthesia by the blue light. This is a subject worthy of consideration, as I said, which may prove of great value to us, and I hope that someone will discuss the subject who knows more about it.

Dr. H. A. SMITH, Cincinnati, Ohio. Experiences have been called for from those who have made use of the blue light. I used it twelve or fifteen years ago. I was called upon once to extract some teeth for a lady, and it was done under the influence of the blue light from the direct rays of the sun. The lady was nervous and emotional to an extreme degree, and being a believer in the effects of the blue light, had had built an extension to her sitting room, which was lined with glass of a blue shade—quite a deep blue—especially in the ceiling. She sent for me to have several teeth extracted in this room. I visited the house, and extracted two teeth on the first occasion without, she said, causing her any pain whatever. In a few months afterward she sent for me a second time, and I extracted three teeth, again without giving her any pain.

I simply mention this to show that it is not a new idea or method. The concentration of the light upon special tissue I think is new, but there is a class of physicians who have great faith in the

use of the blue light for its general effect upon the human body, and this lady was a believer in that theory.

Dr. N. G. SLAUGHTER, Athens, Ga. I would like to ask the essayist if he has ever attempted to extract a pulp under this light?

Dr. HARLAN (closing the discussion). The idea of the use of the blue light is so ancient that there is not a man in this room old enough to be the great-great-grandson of the man who first advanced the theory. There have been many people who have installed in their houses rooms in which to get the benefit of the different kinds of light, principally the benefit of the blue-light bath. When a person is to take this bath he sits in the room for two hours at a time, with the back, arm, or whatever portion of the body he desires to receive its benefits exposed to the blue light. We all know that if you sit in front of a blue light for any length of time you will become drowsy and thoroughly relaxed. If you sit in front of a red light it excites, makes you restless and wakeful. I have experimented a great deal with this blue light, and it has been a wonderful aid to me. When I am to operate on a patient, I simply tell him that I will not hurt him. I then darken the room, and turn on this blue light, and when sufficient time has elapsed go to work without saying anything, and the patient says it does not hurt. I have not attempted to extract a pulp under this light, but I have been experimenting with it for about three years, and Dr. Gordon White was in my office about two years ago and saw some of the incomplete lamps, which are now more complete.

It affords me a great deal of pleasure to present a thought in connection with the utilization of an agent that anybody can handle without deleterious effects to the patient, unless the lamp be placed too close to the face, when it will burn the same as any other ray would.

The next order of business was the report of the Executive Council, through its chairman, Dr. H. J. BURKHART:

I would ask the members of the association to give close attention to the matters which I will bring before you at this time, because in the judgment of the Council they affect the association members more vitally than any matters which have come before the association in a long time. The matter of publishing a dental journal has been agitated for some time, and I am happy to tell you that after a considerable amount of time spent in consultation and discussion, the Council is of the opinion that with the amendments which are to be offered today, and with what can be accomplished by the officers of the association before the next meeting, that, commencing with the next meeting of the association in July or August, you will have a journal of your own. The committee recommends the following amendments to the by-laws, which under the rules will have to be laid over until next year before final action thereon:

Art. V, Sect. 2:

Add to the section—"of which so much shall be set aside as shall be necessary to secure for the member a subscription to the Journal of the National Dental Association."

Art. V, Sect. 3:

Insert after "branches"—"nor be entitled to receive the Journal of the National Dental Association."

(Signed) CHAS. O. KIMBALL, *Chairman*,
E. K. BLAIR,
J. Y. CRAWFORD,

Committee.

The Council recommend that these amendments be presented, and laid over under the rules until next year.

I wish to bring another matter to the attention of the association. It was ordered by the Committee of Fifteen of the Fourth International Dental Congress that the cases containing models, etc., which were exhibited at the St. Louis Congress, be turned over to the Army Medical Museum at Washington. We are informed that that has not been done, and it is recommended by the Executive Council that the association instruct its secretary to request the gentlemen who has charge of these models and cases to at once turn them over to the Army Medical Museum.

On motion the report of the Executive Council was adopted.

Dr. BURKHART then made a report from the Committee of Organization of

the Fourth International Dental Congress, as follows:

It was agreed by this association and the committee acting for it, that a full and detailed statement would be made to this association and to the profession at large at the close of the congress with reference to the receipts and disbursements of the congress funds. I have here the report from the chairman of the Finance Committee, which gives in detail all the sources of revenue to the congress. I have to present also the report of the treasurer of the congress:

REPORT OF THE FINANCE COMMITTEE, FOURTH INTERNATIONAL DENTAL CONGRESS.

Mr. Chairman and Gentlemen,—In submitting herewith the report of the Finance Committee of the Fourth International Dental Congress, we desire first of all to express our appreciation of the courtesy, consideration, and uniform confidence displayed toward us by your committee, and the widespread and universal trust in our integrity and purpose by the profession at large. This mutual trust and confidence left the committee with a free hand and enabled it to enter upon and prosecute its important work to a successful conclusion. On accepting appointment on this committee our first duty appeared to be to study the scope and financial need of the congress, and to formulate, as nearly as might be, an estimate of the probable expense attending its organization and work. Naturally we turned first of all to the published proceedings of the Columbian Congress, thinking that the expense and results of that gathering would assist us materially in the work we had undertaken; but to our surprise and astonishment, no financial report of that congress could be found, and an appeal to the officers, charged with the duty of financing it, threw no light upon the subject whatsoever, so that we were compelled to devise and develop measures of raising money without any assistance from the experience of those preceding us in similar undertakings. The first work of your committee, therefore, and that as a basis upon which to found their efforts, was to formulate a careful estimate of the total expenses probably necessary to organize, conduct, and complete the work of such a congress; secondly, what percentage of the required amount could be derived from membership fees; and thirdly, from what sources the balance of the funds might be procured.

After giving to these questions such study

as time and available experience would permit, it was estimated that from \$28,000 to \$30,000 would be necessary to complete the work along the lines already projected by your committee; and that from \$15,000 to \$18,000 of this amount could probably be derived from membership fees (see minutes of the Chicago meeting of your committee). But just here arose an unexpected and most perplexing problem, occasioned by the decision of your committee already announced, to present to each member the bound proceedings of the congress, for a fee of ten dollars, we having estimated that to report, edit, print, bind, and deliver the Transactions, would cost a sum equal to if not in excess of that fee, so that we were confronted at the start with the necessity for raising from \$12,000 to \$15,000 from sources other than that of membership fees. This, in the judgment of your committee, should be done if possible, without asking for personal subscriptions from individual members of the profession, as is usual with such gatherings.

Four avenues for raising this amount seemed open to us, namely—First, dental exhibits; second, dental societies; third, dental colleges; and fourth, dental manufacturers and dealers. The first of these was certain to yield something, as it had been already decided to make dental exhibits a feature of the congress; the second seemed reasonably certain, as we felt sure that the whole profession was deeply interested, and through its organization would do what it could to make the congress a success. The third was somewhat problematic, as most if not all of our schools were experiencing difficulty in meeting their own necessary expenses; while the fourth was felt by many to be without any promise whatsoever. However, the needs were imperative, the objects worthy, and it was believed by your committee that upon a fair presentation of the matter the manufacturers and dealers would willingly come to our assistance, and it is with the greatest gratification that we are able to report that in this, as in all other matters pertaining to the finances of the congress, we were not disappointed, as will be shown by a detailed statement of receipts appended to this report.

In all the work of your committee there was nothing more gratifying than the encouragement and assistance which we received from the dental manufacturers and dealers, and we are glad to believe that, in their cordial response to our appeal, something of the unwarranted though real antagonism between them and the profession existing through so many years has been broken down; and if

we are right in thus believing, this result, if it were the only one growing out of this most successful congress, would be worth its entire cost of money and effort. Two other experiences were also extremely gratifying to your committee, and we believe they will be also to the entire profession—namely, first, that every subscription to the Congress Expense Fund that was made unconditionally was paid promptly and in full; and second, that out of the hundreds of personal checks received from almost every city and town in the United States, not a single one was protested—a showing we believe not experienced in any other enterprise of like magnitude, and testifying to the high character and honest purpose of the individual members of the congress; and your committee feels that it would be derelict to its privilege and opportunity did it not in this public manner bear testimony to this expression of professional integrity.

The itemized statement of the receipts of the congress from all sources is as follows:

Dental Exhibits.

1904.			
April	11.	Dr. Gallie, chairman committee	\$1,000.00
May	28.	Dr. Gallie	850.00
Sept.	2.	" " cash	258.00
"	2.	" " checks	2,707.49
"	2.	" " "	176.31
"	21.	" " "	181.90
Oct.	17.	" " "	39.72
Nov.	3.	" " (B. Holly Smith)	700.00
			\$5,913.42

Contributions from Dental Societies.

1903.			
Sept.	28.	National Dental Association	\$500.00
Oct.	14.	Buffalo Dental Association	25.00
"	28.	Fourth District Dental Society, N. Y.	25.00
Nov.	14.	First District Dental Society, N. Y.	250.00
"	19.	Pennsylvania State Dental Society	250.00
Dec.	1.	Eighth District Dental Society, N. Y.	100.00
1904.			
Jan.	27.	Syracuse Dental Society, N. Y.	25.00
Feb.	9.	Chester and Delaware County Societies, Pa.	10.00
"	15.	Rhode Island State Dental Society	15.00
"	15.	Colorado State Dental Association	50.00
"	15.	Denver Dental Association	50.00

Feb.	29.	Maine Dental Society	\$25.00	June	17.	Cleveland Dental Society	\$50.00
"	29.	Fraternal Dental Society, St. Louis.....	50.00	"	20.	Alumni Association, N. Y. College of Dentistry	25.00
March	3.	Odontographics, Kansas City.....	50.00	"	20.	Pennsylvania Association Dental Surgery	43.00
"	9.	Reading Dental Society	15.00	"	24.	Milwaukee Dental Society	10.00
"	18.	American Society of Orthodontists	50.00	"	28.	Lehigh Valley Dental Society	10.00
"	22.	District Columbia Dental Society	100.00	"	29.	Massachusetts Dental Society	50.00
"	28.	Virginia State Dental Association	25.00	July	1.	Dallas Dental Society	15.00
April	11.	Institute Dental Pedagogics	200.00	"	7.	North Carolina Dental Society	159.00
"	11.	Maryland State Dental Society	50.00	"	7.	Dental Society of the State of New York..	400.00
"	18.	Detroit Dental Society	41.00	"	8.	Luzerne and Lackawanna Dental Society, Pa.	10.00
"	18.	Jean J. Loizeaux, Boston	1.00	"	11.	Indiana State Dental Association	50.00
"	22.	New York Institute Stomatology	50.00	"	12.	Toledo Dental Society	25.00
"	29.	Metropolitan District Dental Society, Mass.	50.00	"	12.	Academy of Stomatology, Philadelphia ...	69.00
May	3.	New York Odontological Society	200.00	"	12.	Academy of Stomatology, Philadelphia ...	31.00
"	4.	Fifth District Dental Society, N. Y.	50.00	"	13.	Southern California Dental Association ..	12.50
"	4.	American Academy of Dental Science, Boston	50.00	"	13.	Los Angeles Association of Dental Alumni	12.50
"	6.	Valley District Dental Society, Mass.	15.00	"	13.	California State Dental Association	50.00
"	6.	S. E. District Dental Society, Mass.	10.00	"	15.	Chicago Dental Society	100.00
"	7.	Rochester Dental Society, N. Y.....	28.00	"	16.	Harvard Odontological Society	10.00
"	11.	Central District Dental Society, Mass.	25.00	"	18.	Jefferson County Dental Society, N. Y.....	10.00
"	17.	Iowa State Dental Society	100.00	"	19.	Psi Omega Fraternity, Pittsburg, Pa.	150.00
"	19.	Third District Dental Society, N. Y.....	50.00	"	19.	Lynn Dental Society, Mass.	10.00
"	20.	Harries Dental Society, Pa.	10.00	"	25.	Wisconsin State Dental Society	100.00
"	21.	Sixth District Dental Society, N. Y.....	50.00	"	26.	New Hampshire Dental Society	25.00
"	21.	Illinois State Dental Society	300.00	"	29.	Georgia State Dental Society	100.00
"	24.	Lake Erie Dental Society, Pa.	50.00	"	29.	Lycoming County Dental Society, Pa.	10.00
"	25.	Eastern Dental Society	25.00	Aug.	3.	Connecticut State Dental Association	200.00
"	26.	Texas State Dental Society	200.00	"	4.	Odontological Society, Cincinnati, O.	25.00
"	31.	Kentucky State Dental Association	100.00	"	10.	Kansas State Dental Association	100.00
"	31.	Utah State Dental Association	22.00	"	11.	New Haven Dental Society	25.00
June	3.	Susquehanna Dental Association	25.00	"	15.	South Carolina State Dental Society	50.00
"	6.	Second District Dental Society	100.00	"	15.	San Francisco Dental Association	20.00
"	13.	Southern Wisconsin Dental Association..	25.00	"	16.	Michigan State Dental Association	100.00
"	14.	Lebanon Valley Dental Association, Pa.	15.00	"	17.	Ohio State Dental Society	100.00
"	17.	Columbus Dental Society	20.00				

Aug.	17.	Northern Ohio Dental Association	\$50.00
"	18.	Seventh District Dental Society, N. Y....	50.00
"	22.	Tennessee State Dental Association	100.00
"	23.	Southern Branch, N. D. A.	150.00
"	26.	Mississippi State Dental Society	50.00
"	29.	Southern Branch, N. D. A. (second)	150.00
"	29.	Odontological Society, Chicago	200.00
Sept.	1.	New Jersey State Dental Association	200.00
"	21.	Detroit Dental Society (second)	1.00
"	27.	National Dental Association (second) ...	500.00
1905.			
Jan.	19.	Utah State Dental Society	6.00
March	20.	Northeastern Dental Association, Connecticut	100.00
Total			\$7,191.00

Contributions from Dental Colleges.

1904.			
March	4.	Philadelphia Dental College	\$50.00
"	23.	Kansas City Dental College	10.00
"	26.	Dental Department University of Buffalo	50.00
April	11.	Ohio College Dental Surgeons	40.00
"	11.	College of Dentistry, University of Southern California	20.00
"	27.	Indiana Dental College	25.00
May	12.	Dental Department, University of California	50.00
"	18.	Baltimore College of Dental Surgery	50.00
"	21.	New York Dental School	25.00
June	17.	New York College of Dentistry	50.00
July	5.	Harvard University, Dental Department..	50.00
"	9.	Medico-Chirurgical College, Dental Department	100.00
"	13.	College Physicians and Surgeons, San Francisco	50.00
Nov.	11.	University Ann Arbor, Dental Department..	20.00
Dec.	19.	University of Tennessee, Dental Department	25.00
Total			\$615.00

Contributions from Dental Dealers.

1904.			
Oct.	31.	The S. S. White Dental Mfg. Co.	\$500.00
Jan.	9.	E. de Trey & Sons, Philadelphia	10.00
"	13.	Kress & Owen Co., New York	20.00
"	13.	John T. Nolde Mfg Co., St. Louis	100.00
"	16.	Dentists' Supply Co., New York	25.00
"	20.	Mrs. W. M. Herriot & Son, Indianapolis ...	25.00
March	23.	McKesson & Robbins, New York	50.00
"	29.	Oakland Chemical Co.	50.00
April	2.	Friend	50.00
"	2.	Sanitol Co., St. Louis	50.00
"	18.	Dental Protective Supply Co.	100.00
June	17.	Cogswell Dental Supply Co.	25.00
July	28.	W. V-B. Ames, Chicago	25.00
"	28.	Lambert Pharmacal Co., N. Y.	25.00
Aug.	1.	Noah Spears Co., Dallas, Tex.	10.00
"	1.	Lee S. Smith & Son, Pittsburg	50.00
"	11.	J. W. Ivory, Philadelphia	50.00
"	22.	Dutro & Hewitt Dental Depot	25.00
"	22.	Johnson & Lund Dental Depot	25.00
"	24.	Hance Bros. & White, Philadelphia	5.00
"	29.	Consolidated Dental Mfg. Co., Cleveland..	10.00
Sept.	7.	A. C. Clark & Co., Chicago	25.00
"	8.	Dental Brief (L. D. Caulk, Philadelphia)	50.00
Oct.	13.	Buffalo Dental Mfg. Co.	100.00
1906.			
March	9.	Hisey Dental Mfg. Co., St. Louis	25.00
			\$1,430.00

Total contributions from all sources \$15,149.42
1587 members at \$10.00 each..... 15,870.00

Making a grand total of.....\$31,019.42

Received for medals 110.00
" " cases 9.00

Total receipts\$31,138.42

This, as your Treasurer's report will show, is ample to meet all the financial obligations

of the congress in full, leaving a small balance in the treasury.

In conclusion, your committee owes it to itself to state that the total expense for raising this large sum of money, registering the membership, and the many expenses attending it, was about 0.04 per cent., an exhibition in financing dental congresses not previously realized, and only obtainable in this instance because of the fact that the great bulk of the clerical work was performed by the chairman and his secretary, without expense to the congress.

Respectfully submitted,

CHARLES S. BUTLER, *Chairman*,
WALDO E. BOARDMAN,
CHARLES McMANUS,
R. HAMILL D. SWING,
R. M. SANGER,

Congress Finance Committee.

REPORT OF TREASURER, FOURTH INTERNATIONAL DENTAL CONGRESS.

To September 17, 1906.

RECEIPTS.

Dr. C. S. Butler, Chairman Finance Committee.....	\$31,138.42
Dr. Arthur S. Black, refund; section expenses.....	3.00
Bank interest.....	407.47
	<hr/>
	\$31,548.89

EXPENDITURES.

Committee of Organization.....	\$8,712.25
State Chairmen.....	1,336.37
Sections, clinics, and St. Louis Exposition.....	2,814.33
Finance Committee.....	1,701.95
Secretary's office.....	2,920.20
Bailey, Banks & Biddle, prize medals.....	250.00
S. S. White Co., Transactions....	11,799.91
National Dental Association, refund.....	500.00
Southern Branch, N. D. A., refund.....	300.00
California earthquake sufferers...	750.00
	<hr/>
	\$31,085.01

Total receipts.....	\$31,548.89
" expenditures	31,085.01
	<hr/>

Balance \$463.88

Respectfully submitted,

M. F. FINLEY,
Treasurer Fourth Congress.

ATLANTA, GA., Sept. 17, 1906.

To the Organization Committee of the Fourth International Dental Congress:

Gentlemen,—The undersigned committee, appointed by the president of the National Dental Association to audit the finance accounts of the Fourth International Dental Congress, would report that they have carefully gone over the books, vouchers, receipts, and checks of the treasurer and of the chairman of the Finance Committee, and have found them correct in every particular.

S. H. GUILFORD,
J. P. GRAY,
V. H. JACKSON,
Auditing Committee.

The Congress Committee has this recommendation to make with regard to the balance in the treasury. We recommend that the sum of \$447.78, which will be turned over to the association, shall be set aside as a fund to be used in the interests and for the purpose of establishing a dental journal, and that this shall be used for no other purpose without a majority vote of this association.

This completes the report of the Committee of Organization of the Fourth International Dental Congress, and we have only to say that we return to you who commissioned us as your representatives, our most hearty and sincere thanks for the manner in which you supported us in our work. We received from you our commission, and we now return it to you.

Motion was made and carried that the report be adopted.

Dr. JAMES McMANUS, Hartford, Conn. I wish to offer the motion that this association tender its sincere thanks to the Committee of Organization of the Fourth International Dental Congress for the very efficient and noble work they did during the holding of that congress.

The motion was carried.

The next order of business was the election of officers, and the selection of the time and place of meeting for the next annual session.

Dr. C. S. BUTLER moved that the time of the next meeting be set for the last Tuesday in the month of July.

The motion was carried.

Dr. Butler also moved that the next place of meeting be Minneapolis, Minn.

The motion was carried.

ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted as follows:

- President*—A. H. Peck, Chicago, Ill.
Vice-president from the West—D. J. McMillen, Kansas City.
Vice-president from the East—George E. Hunt, Indianapolis.
Vice-president from the South—George S. Vann, Gadsden, Ala.
Recording Secretary—C. S. Butler, Buffalo, N. Y.
Corresponding Secretary—B. L. Thorpe, St. Louis, Mo.
Treasurer—A. R. Melindy, Knoxville, Tenn.
Executive Council—H. J. Burkhart, chairman; Charles McManus, B. Holly Smith, J. Y. Crawford, F. O. Hetrick.
Executive Committee—T. P. Hinman, V. H. Jackson, C. M. Work.

Dr. CARR moved that the officers of the sections and the other committees to be appointed be left in the hands of the Executive Council.

The motion was carried.

The general session then adjourned until Thursday morning.

THURSDAY—Fourth Session.

The fourth general session was called to order Thursday morning, September 20th, at 12 o'clock, by the president, Dr. M. F. Finley.

The first order of business was the reading of the report of the Committee on Oral Hygiene, by Dr. J. P. CORLEY, Greensboro, Ala., as follows:

REPORT OF THE COMMITTEE ON ORAL HYGIENE.

Mr. President and Members of the National Dental Association,—The dental profession has universally accepted the fact that dental caries is possible only in the continued presence of decomposing organic matter. The source of immunity is, therefore, simple and definite. It is logical to suppose that a scientific profession would, in the light of this truth, adopt a system of prophylaxis; but has it done so?

The status of dentistry finds expression in the school, the journal, and the association. How many schools have a lectureship on hygiene and prophylaxis? Some of the more progressive provide a few lectures, but I know of none that require a special examination on this subject. The journals

occasionally contain a good article on hygiene and prophylaxis, but when compared with the volume of reading matter which they present, preventive dentistry is in but scant evidence.

But, most important of all, that organization which should embody the very acme of dental scientific thought, the National Dental Association—composed as it is of the leaders in the profession, with no purpose save the service of their fellow men—spends at least nine-tenths of its time in the contemplation of the *cure* instead of the *prevention* of disease. And when we remember that the object of the association is to evolve the highest order of service, we are amazed and chagrined.

The clinical feature of the association is a fairly accurate index to the clinical status of dentistry. If you will review the clinic of any dental society, from the dental congress down to the smallest local association, you will find that the burden of dental technique is cure instead of prevention. However, based upon the present conception of the etiology of dental caries, a school which does look toward prevention has come into prominence, but their method and watchword is extension instead of sanitation. It is more rational to eliminate the area of susceptibility by improving the toilet, than by cutting it out and replacing it with a filling material.

However, if the time required, the labor involved, the punishment inflicted, the mental, moral, and physical energy exercised in from one to a dozen extension restorations would not insure the adoption of a hygienic régime, then I agree that extension is not only justifiable but commendable. But the average patient can make extension anterior to the first molar unnecessary. It is remarkable that the men who attract the most attention, and who appropriate the most time are those who are most expert in handcraft and manipulative technique; while the man who teaches his patients to care for their teeth, thus keeping them healthy and sound, has no "beaten path to his door."

One of the most important discoveries developed by the study of hygiene is the fact that the perfect denture in normal use is practically self-cleansing; while, on the other hand, the imperfect denture is not only not self-cleansing, but it presents in addition serious difficulties to the maintenance of a sanitary state.

This fact has brought into conspicuous prominence the science of orthodontia. In fact, it stands by its own merit at the very "head of the river" in dento-surgical science. If we would insure immunity from dental ills, we must institute and maintain a state of consistent cleanliness, and in order to make

this condition maintainable the denture must be complete, the arch symmetrical, the occlusion perfect, and mastication normal.

The next important system contemplated by the hygienist is the construction of all restorations—whether it be of crown contour or the entire crown, by crowning, bridge, or plate—as nearly self-cleansing as possible. Thus the banded crown is falling into disuse, and the gold crown is giving way to the inlay restoration. Unhygienic bridge and plate work, too, are condemned by the honest, intelligent dentist.

The third field opened up by the study of hygiene is the tremendous importance attributed to function. The part played by a grindable dietary and vigorous mastication upon the integrity as well as the environment of the teeth, is just beginning to receive due attention.

The medical world, too, is recognizing the profound systemic influence of wholesome, vigorous, enjoyable mastication; and, consequently, is compelling the food manufacturers to put grindable food upon the market. Wholesome, vigorous, enjoyable mastication without an efficient dental armature is difficult, therefore the greater need, from a systemic standpoint, of an efficient masticating apparatus.

We have evolved three systems of prophylactic treatment, which differ more in the method of application than in the treatment itself. Briefly, the treatment contemplates that every free surface of every tooth shall be perfectly clean and polished, and that this condition shall be consistently maintained. The patient is required to remove all organic matter before fermentation takes place, and also to keep all salivary deposits carefully brushed off the teeth and the gums massaged. The system does not assume, however, that the patient will be able to do this so perfectly that caries will be entirely prevented; therefore he is directed, even required, to make periodical visits to the dental office, where the sanitary work may be done by an expert assistant, who is denominated the "dental nurse." The man who has done the most to introduce and establish this system is Dr. M. L. Rhein of New York city.

The next school pleases to call its work the prophylaxis treatment, and differs from the one just mentioned mainly in that it proposes that the sanitary work shall be done by a regular practitioner of dentistry. The most pronounced advocate of this system is Dr. D. D. Smith of Philadelphia.

The third school undertakes to explain to the patient the merits of the prophylactic system, and the evils which result from its non-observance. If he manifests sufficient in-

terest to warrant his adoption of the system, he is instructed in the technique of the sanitary *régime*. He is then required to do all of the preliminary work of putting the mouth in a sanitary state. The dentist completes the operation, probably extending the procedure over several weeks' time, until the teeth are free from all deposits, pits, overhanging fillings, etc., and the patient has fully mastered the art of caring for the teeth. He is then dismissed with instructions to return when he becomes aware that his work is failing in efficiency. In cases where incorrectable asymmetries or excessive destruction of the gum and alveoli make it impossible for the patient to maintain a state of cleanliness, he must needs be referred to one of the two previously mentioned schools.

But of the forty thousand dentists practicing in the United States, only a small per cent. belong to any one of these three classes. During the past month I have examined patients hailing from thirteen states, from New York to New Mexico, and a conservative estimate would place the number of dentists who give any instruction in oral sanitation, or who require their patients to observe a prophylactic *régime*, at less than ten per cent. I have had opportunity to observe the methods practiced by the "lay" dentist, and my opinion is that the average dental practitioner does not know what a clean mouth looks like.

It is not uncommon to have a patient say that his dentist told him that the stains on his teeth were a protection, and should not be removed. It is still more common to hear him say that he has been warned against the too frequent use of abrasive powders, for fear of wearing the enamel off of the teeth; many laymen give the same reason as their excuse for not using the tooth-brush.

The subject of a popular treatise on oral hygiene has been before this body for several years. It offers many possibilities, but its accomplishment is attended with many difficulties. The treatise would deal extensively in details, and in this field there is such a diversity of opinion, even among recognized authorities, that the work must necessarily be done by one man. However, should a practical treatise be once published under the auspices of the National Dental Association, it would undoubtedly be accepted by a majority of the ethical practitioners of dentistry, both within and without the association, and would find no competitor in the field.

If the association adopts the President's suggestion that the sum of \$250 be appropriated to defray the expense of publishing a first edition of one thousand copies to be distributed among the profession, giving

one to each member of the National Association, and placing the rest in the hands of the state and local societies, with a subscription blank attached, it is possible that a sufficient number of sales could be secured to pay the expense of another and larger edition. There are thousands of patients who would gladly pay for such a work, and it would save the dentist many tedious hours of instruction.

I believe that a satisfactory work could be sold at twenty-five cents, provided the author gave his services without remuneration. I think that such a proposition would be forthcoming, especially if he were promised a small royalty on all editions after the first. The scheme is well worth the experiment, for it would at least open the way to something better.

The National Dental Association should exercise a paternal interest in every dental association and every dental practitioner in the United States. Whatever helps to shape the status of dentistry, whether it be the college, the examining board, or the society, comes within the association's legitimate field. The committees of the National should so direct their efforts that every dental organization in the country would be inspired to do better work.

The Committee on Oral Hygiene, in order to accomplish work of definite value, should have an auxiliary organization in every state society. These subcommittees should have immediate charge of the work in their several territories. They could apportion it out to local societies or to individuals, as opportunity and expediency suggested.

The central committee would study the question in a general way, make general rules and suggestions, and collect annual reports for data. The National Dental Association could in this way do a work of evangelization which would contribute more to the real science of dentistry than could be done through any other channel.

The *personnel* of this committee should be constituted of men of prominence who are practical and enthusiastic, willing to work without the fear of punishment or the hope of reward. The committee should be appointed from the members present before the adjournment of the meeting, so that they might hold a meeting before adjournment, for the purpose of organizing and planning the year's work. Each man could be assigned to some special feature of the program, thus relieving the chairman and secretary of the burden of the work, and at the same time accomplishing it in a more systematic and influential way.

The committee should be composed of men of broad-minded liberality, or else it would

be impossible to arrive at any definite agreement as to the plan of action. This was abundantly demonstrated in the experience of the present administration. The work of the committee was effectually blocked by one man, who would neither suggest a plan nor agree to any plan suggested and indorsed by all the other members of the committee. Owing to a lack of unanimity the committee could undertake nothing as a body, consequently about the only work done was that for which the chairman assumed the responsibility.

The following circular letter was sent to all state associations, by the secretary, Dr. Stiff:

*Mr. President and Members of the—
State Dental Association:*

Inasmuch as the purpose of dental science is to put into operation the laws of oral hygiene, and remembering that many practitioners of dentistry, as well as the general public, are unversed in the science of prophylaxis, the chairman of the National Association's Committee on Oral Hygiene requests that each state association create a standing committee on oral hygiene, whose duty it shall be to promote the cause among the members of the profession, and through them to educate the public.

He desires, further, that these committees shall constitute a subcommittee to co-operate with the committee from the National, in an effort to establish the fact that oral hygiene is the very basis of dental protection.

Please notify me, through the secretary, Dr. Stiff, what action you may take in the matter.

J. P. CORLEY, *Chairman,
Committee on Oral Hygiene, N.D.A.*

The following letter was also sent to all state associations:

*Mr. President and Members of the—
State Dental Association:*

I am requesting that your state examining board give a practical and theoretical examination on oral hygiene and dental prophylaxis. I am also requesting the dental colleges to put in a professorship, or at least a lectureship on the subject.

I desire that you shall pass resolutions indorsing the measure. Please notify me, through Dr. Stiff, the secretary of the committee, what action you may take in the matter.

J. P. CORLEY, *Chairman,
Committee on Oral Hygiene, N.D.A.*

The following letter was sent to the various state examining boards:

Universal recognition of prophylaxis as the highest expression of dental science impels

the chairman of the National Dental Association's Committee on Oral Hygiene to request that the ——— State Dental Examining Board give a theoretical examination on the fundamental principles of oral hygiene and dental prophylaxis, and that each applicant for license, at the conclusion of his specimen clinic, be required to point out and describe the procedure necessary to put the patient's mouth in a thoroughly hygienic condition. Also, that he instruct, in your hearing, the patient in the best method of keeping the teeth and mouth in a healthful condition.

Please notify me, through the secretary, Dr. Stiff, what action you may take in the matter.

J. P. CORLEY, *Chairman,*
Committee on Oral Hygiene, N.D.A.

However, the matter was put into the hands of the secretary so late that action by most of the associations had to be deferred until next year. The Alabama association elected a committee and indorsed the request made to the examining board and colleges. Their committee is now at work canvassing the dentists of the state endeavoring to get the "rank and file" into line.

The chairman of your committee requested of the National Association of Dental Faculties and the National Association of Dental Examiners the privilege of presenting the matter suggested in the foregoing circular letters.

The National Association of Dental Faculties had such a full program that they were unable to entertain the request, but through the good offices of Dr. Chase, a member of the committee and also a member of the National Association of Dental Examiners, the matter was presented to the Dental Examiners, who very kindly extended the courtesies of the floor to the chairman of your committee, and after an interesting discussion by a majority of the association, the following motion prevailed:

"RESOLVED, That it is the sense of the National Association of Dental Examiners that each state dental examining board include in its curriculum five questions on Oral Hygiene and Dental Prophylaxis."

After the adjournment of the National Association of Dental Examiners and the National Association of Dental Faculties, the conference committee of the Examiners Association presented the matter to the conference committee of the Faculties Association, who approved of their action and agreed to give the matter due attention. This is the most substantial encouragement which your committee has received.

The latitude and functions of this committee have never been discussed by the asso-

ciation. My closing request is that the matter be taken up and fully canvassed at this time, so that your next committee may plan their work with the conscious approval of the association.

Dr. H. J. BURKHART, chairman of the Executive Council, presented the report of the Committee on Journal, as follows:

REPORT OF THE COMMITTEE ON JOURNAL.

To the National Dental Association:

During the meeting of the National Dental Association at Asheville, N. C., in 1903, the suggestion was made that the National Dental Association should take over the *International Dental Journal*, free of all debt, with an assured position, with a list of subscribers and advertisers; and an expression of the stockholders of that journal present showed that all except Dr. Crouse were in favor of giving that journal to the National Dental Association.

A committee was appointed to consider the matter and report. The next year, 1904, being the International Dental Congress at St. Louis, there was no meeting of the National Dental Association and no report from this committee.

At the Buffalo meeting in 1905, the president in his annual address recommended that the *International Dental Journal* be taken over, and that a committee be appointed with power to act. The Committee on the President's Address recommended that the association should have a journal of its own, and a committee of three should be appointed to devise ways and means to this end. At the suggestion of Dr. Crouse the number was increased to five.

Dr. H. L. Wheeler then offered a resolution "That the report be adopted with the amendment as offered, and that a committee of five be appointed by the chair to consider ways and means to bring this about, and if necessary with power to act." This was carried. At the evening session of the same day the committee was appointed, consisting of Drs. C. O. Kimball, W. H. Potter, Herbert L. Wheeler, L. G. Noel, and E. MaWhinney. The last named not being a member of the National Dental Association, Dr. B. Holly Smith was appointed by Dr. Finley to fill the vacancy.

The Committee on the Journal, at the very moment of its appointment, found upon inquiry not enough funds in the treasury to warrant it in accepting the offer of any of the publishers who submitted figures for publishing the *International Journal*, the Lip-

pincott prices being the highest of any, much greater than they had been receiving. Besides this, at the first session of the association, action had been taken shutting out various reputable and independent societies from membership in the National body, several of these societies being the ones that had pledged moral and financial support for the hoped-for independent journal. These were forced by the action of the National Dental Association itself to withdraw the offer of support they had so generously made.

The action of the National Dental Association—giving away their proceedings, and excluding the independent societies, and the low state of the treasury—made it absolutely impossible for the committee to secure either publishing material or financial support enough to warrant them in taking over or securing by contract the *International Dental Journal*.

Meanwhile the board of directors of the *International Dental Journal* had taken action so as to legally turn that journal over to the National Dental Association in case their offer to give it to the association was accepted, but, finding that the proceedings of the National Dental Association for the year 1905 had been given away and their offer not promptly accepted, they decided to close up the affairs of the *International Dental Journal* and suspend its publication. Your committee endeavored to induce them (the board of publishers of the *International Dental Journal*) to keep the journal alive for another year, until the proceedings of the National Dental Association for the year 1906 would become available, and to give the time necessary to effect the change of ownership and management, and various members of the New York Institute of Stomatology, who were also on the board of directors of the *International Dental Journal*, endeavored by every means possible to persuade the magazine to continue another year, even promising substantial financial support. This was done in the hope that on second thought the National Dental Association might rescind its action of 1905 and again welcome members from reputable independent societies. All was of no avail. The board of directors of the *International Dental Journal* refused positively to continue publishing the journal for another year; so that it would cease in December 1905—unless at three weeks' notice your committee would undertake the whole management of the journal, finding editor, publisher, and advertising, without material from the association to publish or funds to draw upon.

Your committee believes that the offer of the *International Dental Journal* was a generous and useful one, but that it was made under such peremptory conditions as to make it practically impossible to accept it, unless the proceedings for the year had been placed at its disposal and a considerable sum of money set aside to meet necessary expenses connected with its management, and this done immediately, without thorough investigation or preparation for the transfer on the part of the association—which it seems to us was unreasonable.

Being unable to obtain a new lease of life for the *International Dental Journal*, various independent societies immediately took steps to organize some form of journal in which to publish their several proceedings, as they were unwilling to give the control of their proceedings to any journal controlled by and issued in the interests of a supply house.

Those societies have decided to publish their proceedings themselves, making the annual dues of each member cover his subscription and pay for the expenses of publication according to the number of pages of matter furnished by each society and the number of copies sent to members, the contribution of each society being controlled by its own editor, each society being responsible for its own utterances; the general management being vested in a committee from all societies.

Your committee knowing what was being done in this line, met in New York on December 5th, and after much discussion on the subject it was resolved to "defer action until we have the results of the attempt of the New York Institute of Stomatology and others to publish their own proceedings, in the hope that it will furnish us with new light upon the subject."

The first number of this new journal appeared in April, the intention being to publish it quarterly unless the National Dental Association should join in the enterprise, in which case it would be published oftener. The second number should have appeared in July, but owing to the necessity of the societies joining in the publication taking formal action to set apart funds for subscription to the journal for its members, in order to comply with the United States postal laws, that issue has been greatly delayed.

The cost of the new journal (including printing cover, binding, printing text, wrappers, directing, and mailing) is \$1.80 per page for a quarterly publication of one thousand copies. Making of half-tone plates is extra. Printing illustrations, cost of glazed

paper, etc., amounts to \$1.57 per page. At this rate the cost of publishing the contents of the "Transactions of the National Dental Association for 1904 and 1905," in magazine form, would have been about \$1000 or \$1100. This does not include cost of editing the transactions, but on the other hand it provides for no advertisements, which would more than meet the total expense. So that when the publication is fairly under way there should be left over a profit for the association.

Your committee, believing that it is desirable to make a beginning in this matter now, to that end recommends that arrangements be made with the societies publishing the above journal, to join with them in publishing its proceedings under the same conditions upon which they do.

And in order to conform to the postal regulations of the United States, we recommend that an alteration be made in the constitution by which part of the annual dues of each member be set aside to pay for his subscription to the journal (see action of the American Medical Association June 16, 1875), and if necessary that one or two dollars be added to the annual dues of this association to defray the cost of the journal, and that the Publication Committee be instructed to carry out these recommendations.

We also recommend that steps be taken to enlarge the National Dental Association by admitting upon equal terms all reputable practitioners of good standing in reputable societies, and to this end we recommend that a committee be appointed at this meeting to revise the Constitution and By-laws.

CHAS. O. KIMBALL,
HERBERT L. WHEELER.
B. HOLLY SMITH,
L. G. NOEL,
W. H. POTTER,

Committee.

The next order of business was the report of the Committee on Army and Navy Dental Legislation, by Dr. WMS. DONNALLY, Washington, chairman.

[The substance of this report has already appeared in the communication of Dr. Donnally in COSMOS for November 1906—vol. xlviii, p. 1104. It will appear in full in the volume of Transactions.]

Dr. CRAWFORD. In view of the very great importance of this question, and in view of the limited time in which we have to consider it, and the great danger of moving somewhat precipitately, I make

a motion that we extend to the chairman of this committee, and the members of the committee, our sincere thanks for the constant and vigorous efforts that they have made along the line of legislation pertaining to the question of dental surgeons in the army and navy, and that a committee of five be appointed to act in conjunction with the President and Executive Council to control the matter of legislation.

The motion was carried.

Motion to adjourn was then made and carried.

THURSDAY—*Fifth Session.*

The fifth general session was called to order Thursday evening, September 20th, at 8 o'clock, by the president, Dr. M. F. Finley.

The first order of business was the report of the Executive Council by Dr. A. H. PECK, secretary. The report included the following item:

On behalf of the Jamestown Exposition Dr. Thorpe requested a provisional loan of five hundred dollars. After some discussion the Council by vote recommended that if after a time the funds in the treasury permit, one, two, or three hundred dollars, according to which amount can be spared, be donated to the Jamestown Congress, with the proviso that the amount shall be refunded by said congress, should the funds of the latter permit.

On motion the report was adopted.

The report of the Committee on Necrology was next presented, embracing obituary notices and appropriate resolutions referring to the decease of Drs. Chas. C. Chittenden of Madison, Wis., John A. Chapple of Atlanta, Ga., and Chas. W. Stainton of Buffalo, N. Y.

On motion the report and resolutions were adopted.

Dr. C. S. BUTLER moved that as there was no member of the Committee on the President's Address present to make a report, the report be referred to the Publication Committee.

The motion was carried.

The report as subsequently handed to that committee was as follows:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

Mr. President and Gentlemen:

Your committee desires to congratulate the association upon the able character of the President's address. It exhibits a watchful interest in the welfare of the association and the profession generally.

We respectfully report the following recommendations:

(1) We recommend the appointment of a committee to assist in the revision of the U. S. Pharmacopeia that may confer with Dr. H. C. Wood and request representation.

(2) We recommend the concurrence of this body in the action of its officers in incorporating the National Dental Association.

(3) We also recommend the approval by this body of the action of its officers in contributing \$250 to the San Francisco Dental Relief Fund.

(4) We recommend the appointment of a committee to secure the passage of a law appointing a dental assistant curator for the Army Medical Museum and Library, who shall be a dentist.

(5) We approve the suggestion of employing someone to devote his entire time to research work, but your committee does not feel that the funds of the association would warrant any appropriation at the present time.

(6) We heartily recommend the suggestion of the president to support the efforts of the Committee on History. Every member of this association should subscribe to Dr. Guerini's work.

(7) Action having been taken by the Executive Council in regard to the publication of a journal by this body, no further recommendation is necessary on the part of your committee.

(8) The section work as carried out at this meeting has been so satisfactory that we heartily concur in the recommendation of the president, and suggest the continuation of the present plan until the membership has so increased as to make a change necessary.

(9) We suggest the adoption of a rule requiring all essayists to furnish a synopsis of their papers in time for the appearance of the same in the program issued prior to each meeting.

(Signed) B. HOLLY SMITH, *Ch'man*,
JNO. I. HAET,
R. M. SANGER,

Committee.

There being no further business to come before the association, the president, Dr. Peck, declared the meeting adjourned until the next annual meeting.

A. H. PECK, *Recording Sec'y.*

SECTION III: Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

Chairman—G. V. I. BROWN, Milwaukee, Wis.

Secretary—W. H. G. LOGAN, Chicago, Ill.

THE first meeting of Section III was called to order by the chairman, Dr. G. V. I. Brown, Milwaukee, Wis., Wednesday evening at 8 o'clock, September 19th, 1906.

The first order of business as announced by the chairman was the reading of a paper by Dr. GORDON WHITE, Nashville, Tenn., on "Treatment of Pyorrhea Alveolaris."

[This paper is printed in full at page 247 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. L. G. NOEL, Nashville, Tenn. I believe I was selected to open the discussion on Dr. White's paper because I was at one time associated with him, and am still practicing in the same city with him and can tell what he is doing along this line. He has produced some very marvelous results in the treatment of these cases, and it gives me great pleasure to state that he has thoroughly mastered many cases that would baffle almost any

of us. In beginning his treatment he succeeds in impressing his patients with the fact that he is master of the situation, and he dominates and controls them to such an extent that they will do anything he demands and believe anything he says, and that is one reason why he succeeds so well with his cases.

I am somewhat inclined to criticize the opening sentence of the paper, in which occurs the phrase, "how I cure pyorrhea." Now I object to that because I do not believe anybody ever *cures* pyorrhea, but rather only relieves the condition. The essayist states farther on that the patients who follow his suggestions as to constitutional treatment, and come back for local treatment faithfully, are the cases in which he obtains his best results—a statement that will coincide with the observation of most of the older practitioners.

Dr. White succeeds in impressing his patients with the serious nature of the disease, and I can say that he gets results that are very wonderful to me, and which I have very seldom seen in the hands of other practitioners. I wish he had exhibited the instruments that he uses to remove the tartar. He has in addition to his power to impress the patients with the evil results of this disease, a wonderful touch in the removal of the deposits. It has always been my belief when the disease has extended beyond the bifurcation of the roots that the case is hopeless, but Dr. White will often amputate a root and save parts of teeth only, for the attachment of the crowns, thus bringing about wonderful results.

It gives me great pleasure to state that I have seen many of the cases years after his treatment, and it has been a surprise to me that the original condition of inflammation in the gums had not set in again.

Dr. A. W. HARLAN, New York, N. Y. I have been very much interested in the pictures presented by Dr. White and have seen some of the models, in fact I have seen all of them, and must say that the results of this treatment are apparently very satisfactory.

In the treatment of loose teeth we must

recognize certain things. At the present time the question of the causation of this condition is still in dispute, because there are many factors to be considered in the matter. We have some constitutional diseases and we have some local troubles to contend with which must be recognized. The man who, when standing before you, continually blows his breath at you, is one who is a victim of what might be considered a potent factor in the causation of loose teeth—mouth-breathing.

The illustrations in Dr. White's paper explain themselves, but we must go back of that. There are many conditions contributing to the causation of loose teeth, which have not been considered fully in any paper or presentation of this subject. I only have to say that I believe, in order to arrest any condition that will cause the loosening of the teeth, there are in addition to constitutional treatment some local operations that are absolutely necessary. The first thing is that the teeth must be held firmly in position; secondly, the roots of the teeth must be thoroughly deprived of any extraneous concretions or accretions of deposits, so that the tissues will have an opportunity to return to their normal shape; thirdly, we must have cleanliness, and that is a matter which every man must determine for himself. We must also have occlusion of the teeth so that irritation may not be kept up by malocclusion, and our object can only be accomplished by cutting and grinding, all of which I think Dr. White has brought out in his paper.

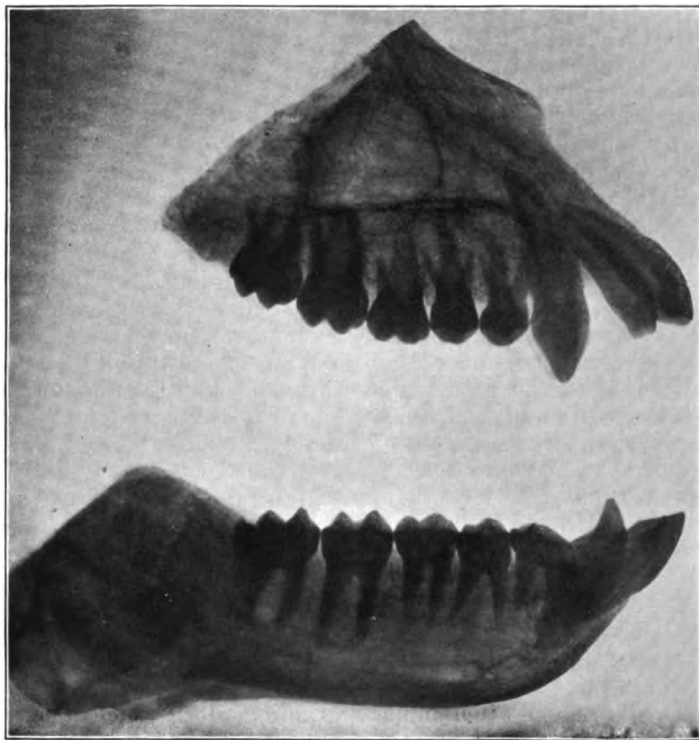
Dr. M. L. RHEIN, New York. Before showing some slides that I wish to exhibit, I wish to personally compliment Dr. White on the results which he has presented to us. What I have to say this evening is entirely on this subject, but upon a somewhat different phase of it. I want to call attention to the fact that in pyorrhea alveolaris, loose teeth, Riggs' disease, pathological conditions of the periodontal membrane, or any other name you wish to use in discussing this subject, the important point to consider is the one that presents itself to every dentist and every physician when any case of disease comes before him, and that is

the question of diagnosis, and what is more important still, the question of differential diagnosis. The two important points to be considered are the exciting cause and the predisposing cause. I wish to especially direct your attention to the fact that the difficulty of treatment of

that if you know what you are treating, you know how to treat the case, and you are also able to tell your patient in advance what the results will be of your treatment.

The slides I shall show you are made from radiographs—not photographs—

FIG. 1.



these conditions—which are such a factor in the destruction of teeth and the reason why the profession at large has met with the poor results of which so many complain—is because the treatment has been pursued in an empirical way. Empiricism has been the retarding factor in the progress of our specialty since I can remember, and as we leave its realm so are we able to advance gradually toward success with our treatment, and bring such results as Dr. White has shown us, not occasionally, but invariably and understandingly. I claim

showing absolutely every portion of the tissue from the enamel down to the end of the root. Necessarily, and unfortunately, slides of this kind on account of their density do not show up so well on the screen as the ordinary photographic slide can be made to show. I therefore ask your indulgence for them in this respect, and will endeavor to make clear the points more easily discernible by those who are accustomed to examine and interpret radiographs.

The first thing necessary in order to formulate a correct diagnosis of condi-

tions of this kind is to know the difference between the physiological normal alveolus and the one in which pathological conditions exist. Now I shall show you two slides of cases where there was a local condition that might be called pyorrhea, but in both cases the alveolus is absolutely normal, and you will notice the great differentiation in the alveoli in these two cases from those which are pathological. The first, Fig. 1, is the case of a monkey that I obtained at the Rockefeller Institute in New York. He was inoculated in the course of investigations on spinal meningitis. This monkey died finally from inanition, and the director of the institute called my attention to the great amount of calculus deposit around the teeth, and I thought we had a good case of pyorrhea; so I turned the specimen over to Professor Broomell, and to our astonishment we found a normal alveolus. This illustrates what happens so often in practice, where we see many cases in which deposits are simply the localized expression of a constitutional disorder. This difference can be seen in the other slides. The density of the radiograph does not enable us to bring it out so clearly, perhaps; however, they show absolutely all of the portions of the alveolus, which is intact. All of the white substance is osseous tissue, and there appears to be no destruction of any portion of it. It shows a perfectly physiological jaw, although there is a great amount of calculary deposit, and it is therefore a most interesting specimen to study in comparison with pathological specimens.

This next case, Fig. 2, was one of a loose bicuspid, and the patient was referred to me as one suffering from pyorrhea and demanding attention. The radiograph, while it shows an absolutely healthy condition of the osseous structure, presents one pathological point: A careful examination of the radiograph shows that inflammation of the pericementum had existed, and that the looseness of this bicuspid was entirely due to local irritation brought about by a badly made gold shell crown, the exciting cause of the inflammation in the peridental

membrane. The removal of the pulp and the proper crowning of the tooth effectually cured the case.

FIG. 2.



Now I will show you in contradistinction one of the ordinary types of pyorrhea in which considerable destruction of the tissues had taken place. (Fig. 3.) Here is the neck of the tooth; the bone

FIG. 3.



is absorbed down to this point [indicating], and although in these cases the gum may extend to its normal position, the bony septum between the teeth may, as here, be lost. The value of the X ray both in diagnostic work and in treatment is exemplified in this case. Dr. Harlan has mentioned one of the axioms in the treatment of cases of this kind, that "Every particle of these deposits must be removed." Now it is impossible for any deposits to be on these teeth that the radiograph would not show. Very frequently, however, the operator is deceived about this thing. Often the patient, as Dr. White has said, will come back, which means that deposits still remain. This X ray shows the accretion on the side of the root most beautifully.

The main thing I have to say is that the X ray is an aid to correct diagnosis; but I do not care to have you construe this remark as meaning that the X ray can be absolutely depended upon, for that would be going to the extreme, and would not be warranted by the facts. In the first place, you must accustom yourself to the examination and study of the X ray in order to understand what you see, and even then we are sometimes deceived. On that account I simply present it to you as an auxiliary in diagnosis.

This next case, Fig. 4, is one that I present to you in order to show where the

FIG. 4.



X ray in itself is deceptive in what it shows. In other words, even one who is careful in making a study of radiographs can be deceived by this picture. We have an upper second bicuspid, with a light line surrounding the apex of the root. When you see an area of this nature anywhere around the root of a tooth in this condition, it is an indication of the existence of an abscessed condition, and is one of the most valuable diagnostic signs we may obtain with the radiograph. It invariably reveals pericemental abscesses in teeth with vital pulps.

This is a case that was transmitted to my care by my father-in-law about fifteen years ago, and which had been in his hands for a number of years. (A great many of the members present will undoubtedly still remember the name of Dr. Odell.) In the treatment of that patient's mouth I was careful to avoid doing anything to this tooth, because it was a beautiful restoration of a tooth with

a gold filling that had been in place up to a year ago for over thirty years. About a year ago the patient complained of neuralgic symptoms in this region, and to aid in diagnosis I made this radiograph, which fails to disclose any root-filling. I had supposed that this large gold restoration was over a pulpless tooth with a root-filling in it. You see how plainly the radiograph shows a loss of root tissue—the tissue being absorbed at the end of the root with this long-standing abscess around it. This had finally proceeded to such an extent as to cause severe pain to the patient. Now here is where the radiograph deceived me. In exploring the root-canal I found to my astonishment that that root was thoroughly filled to the end with cotton. I had never seen a cotton filling before that did not smell. There was no odor from it, and it was packed tightly to the end of the root, and was one of the most difficult fillings I ever had to remove. I simply call your attention to the fact that the cotton root-filling does not show up.

You will notice in the adjoining first bicuspid which I had crowned some years ago, the root-filling extending to the end of the root quite distinctly. This case was entirely cured by means of the electrolytic treatment. The electrode was passed through the opening in the root into the surrounding tissue, the area absolutely disinfected, and the root-filling restored—a very satisfactory result ensuing.

The next slide, Fig. 5, shows a loose

FIG. 5.



lower third molar with deposits and pus, a type of case that a large portion of the

profession would take for a pyorrheal case pure and simple. This was my opinion until I took an X-ray picture, and found this amalgam filling entering the pulp-cavity, with no sign of the pulp ever having been interfered with. It turned out to be simply a case where the exciting cause was an improperly inserted amalgam filling which had caused the death of the pulp.

The next picture I ask you to notice. Fig. 6, shows an upper lateral with vital pulp and a pericemental abscess at the apical region. This patient is a member

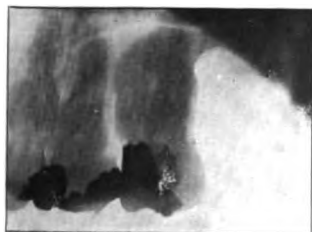
FIG. 6.



of the New York State Dental Society, and came to me with a pyorrheal condition of the mouth, and this tooth, a lateral, was the one most affected. The picture shows the pyorrheal condition of the tooth, with the absorption progressing at the end of the tooth. The removal of the pulp and the filling of the root cured the case.

The next case, Fig. 7, is a case of marked pyorrhea that I would designate

FIG. 7.



as gouty—pyorrhea arthritis—a case in which the condition is most marked.

The pulps are almost obliterated by the filling up of the pulp-chamber with secondary formations. These are the cases that give trouble in treatment, because of the difficulty in filling such canals to their ends.

The next slide, Fig. 8, is a case showing a marked condition of pyorrhea

FIG. 8.



around a lower molar, complicated with an alveolar abscess. The next molar has been properly treated by removing the pulp and filling the canals. I want to call your attention in this radiograph to the differentiation of the tissues, and also to the inferior dental canal, which is distinctly running along below the molar.

The next case is a very interesting one, and will be shown by the four succeeding slides. The first slide, Fig. 9, shows an abscessed condition over these bicuspid. In the molar is the evidence of an old root-filling of one of our ablest dentists in New York city. The lingual root had been partially lost, and the filling is seen protruding beyond the absorbed end of the root. The next slide, Fig. 10, shows the opposite side of the same patient's mouth, where the conditions are worse. This patient was referred to me to see if I could possibly save these two loose molars. A great many dentists had seen the case, and all claimed that the teeth were so loose that nothing could be done with them. They were almost ready to drop out of their sockets; it is hard to realize how little retention they had. You will notice that an attempt has been made to open into the buccal and lingual canals of these teeth, which was unsuccessful on account of the filling up of the canals with secondary matter—but it is useless to treat

such cases unless the canals are cleaned and filled to the ends. The next slide, Fig. 11, shows these two molars after the buccal canals have been properly filled. There was no attention paid to the lin-

teeth, the simple removal of the pulps and reproducing the lost lingual root, was not all that was necessary. It was necessary, as the preceding gentleman has said, to hold the teeth fixed. I am

FIG. 9.



FIG. 10.



FIG. 11.



FIG. 12.



FIG. 13.



FIG. 14.



gual roots in either of these teeth, because both the lingual roots had lost all of their attachment and had become necrotic appendages which had to be amputated. After removing the roots I replaced them by porcelain substitutes, as I have described in some of my papers in years gone by. The mere treatment of these

opposed to the use of bands for that purpose, for reasons which I will not enter into now. The method used here was to run a platino-iridium wire into the porcelain root that was placed in position in the second molar, running it up across the occlusal surface and into the pulp cavity of the first molar. The same con-

dition was observed in the first molar. A platino-iridium wire in the porcelain root was carried across the occlusal surface and into the pulp-cavity of the second molar. All this was done at one operation, and the wires were cemented into place by means of amalgam. The illustration, Fig. 12, shows the finished operation. It shows the porcelain root of the second molar and the platino-iridium pin as it extends and crosses over into the first molar. The dark mass is the amalgam restoration which firmly holds the two teeth together. The porcelain root on the first molar, for mechanical reasons I thought best to leave at the angle shown instead of at right angles, believing that I should thereby get better retention.

And here I want to call your attention to a very vital point in the treatment of loosened teeth in holding them together by splinting. It is usually thought when you splint loose teeth together, that in order to hold them firm it is necessary that they should be attached to a tooth that is not loose. That is a common error. Two loosened teeth splinted together will be firm, for the reason that the roots protrude through the alveolus at such divergent angles that they pull against each other, and produce the firmness which we desire. That is an important point which I do not believe has ever been brought clearly before the profession.

The next and last case I consider also as one of the extreme ones. What I am trying to demonstrate here is that many cases said to be hopeless can be saved. Fig. 13 shows a lower central incisor in the mouth of a young married woman. The alveolar attachment is almost entirely lost. The pyorrheal area is well marked. The pulps of this and of the adjacent teeth were removed and the ends of the canals filled. A splint of the shape of a three-pronged fork was then made of iridio-platinum, attached to three inlays filled into the three pulpal openings and then cemented into the three roots. The last slide, Fig. 14, shows the completed operation.

Further discussion of Dr. White's paper was deferred until after the reading of the next paper.

The chairman then announced as the next order of business the reading of a paper by Dr. H. J. ALLEN, Washington, D. C., on "Lymphatic Stimulation in Dental Practice," as follows:

LYMPHATIC STIMULATION IN DENTAL PRACTICE.

It is only during recent years that the lymphatic system has received from physiologists the attention which its importance demands. All the older physiological text-books give only a vague conception of the mechanism of the system, and few venture to impart any information as to its functions.

The development of special knowledge of these functions has been consequent upon, and coincident with, our increasing knowledge of the bacterial origin of disease. Pasteur, Koch, Behring, Metchnikoff, and Foster have within the last decade made astounding discoveries relating to the functions of the lymph stream, which have revolutionized the treatment of infective diseases in general.

As one of the results of these discoveries a number of pseudo-scientific geniuses have applied the forceps to their respective imaginations, and delivered full-fledged systems of lymphatic therapeutics which they are certain are going to revolutionize the accepted theory and principles of general practice.

Osteopathy, which is the pseudonym under which a large percentage of the public are at present having their lymphatic systems stimulated, bears about the same relation to the regular practice of medicine and its collateral branches that astrology bears to the science of astronomy.

The good and the bad, the true and the false, theories and facts, are merged and cemented together by the imaginative intellects of second-hand discoverers and inventors of systems, who do not hesitate to utilize any fad, fact, or fancy, in order to put their systems on a dividend-paying basis.

Still, under the spangles of the mountebank, true therapeutic worth lies concealed. Vibration administered by

empirics has unquestionably produced in some cases most excellent if not marvelous results, and it must follow that this physical method in the hands of a conscientious and thorough man—one who pays strict attention to his pathology, physiology, and anatomy—will produce results that are almost miraculous in certain cases.

The art of massage and manual manipulation dates from the most remote antiquity. Thousands of years ago the Chinese had written treatises on the subject, and Hippocrates makes frequent references to the subject in his writings. In one paragraph he says, "Rubbing can bind a joint that is too loose, and loosen a joint that is too rigid. Much rubbing causes parts to waste, while moderate rubbing makes them grow."

Hippocrates was also the first to record the employment of mechanical vibration—"wrapping one end of a saw with cloth that was applied to the part to be treated, while sawing a piece of wood with the uncovered portion, thereby producing vibratory oscillations in the affected part."

Galen and Paracelsus also used and advocated similar methods in their practices.

From these remote times until the present, methods of vibration or massage have waxed and waned, until at the present day vibratory massage has come to be recognized by the medical profession as an efficacious procedure in the treatment of numerous local and constitutional disorders. And yet today's researches reveal only how much more complex is the body's metabolism than yesterday we thought it to be, and in the problem of vibratory therapeutics there is certainly much more before us than behind us. Lying as it does on the border zone where the physiologic and the pathologic meet, it reaches far into both, and obscures the division line between them.

In any disease the organism makes a constant effort to recover "that just balance which we call health," and now that it is possible for the physiologic and metabolic forces of the body to be marshalled and intensified in order to assist this effort by vibratory treatment applied with

intelligent persistence, we can but feel that the armamentarium of the medical and of the dental therapist has been greatly increased in efficiency.

A succinct review of the lymphatic system—which is the main function of the body affected by vibratory massage—would not be out of place at this juncture.

The name is derived from the Latin word *lymph*a, water, and in view of the knowledge on the subject at the time this name was given, could well be termed the "water-system" of the body.

The system consists of vessels and glands that commence in a series of lymph capillaries in the organs and tissues of the body, and terminate in two large trunks which open into the larger veins near the heart—the thoracic duct on the left and the right subclavian trunk on the right. The vessels are very thin, vary from transparent to translucent, and permeate all tissues excepting the non-vascular structures, such as the hair, nails, and the enamel and dentin of the teeth. They are beaded in appearance, being interrupted in their course by constrictions which lately Foster and Ziegler have agreed are valves which act similarly to those of the veins, and serve to give impetus to the flow of the lymph.

The glands of the system vary in size from that of a small seed up to that of an almond, and are situated in the course of the vessels. A lymphatic vessel, before entering its gland, breaks up into several branches which are known as afferent. The vessels as they leave the gland are called efferent.

The lymph capillaries are made up of a single layer of endothelia, whereas the larger vessels and glands have a middle muscular coat and an outer adventitious one. This structure at once makes apparent the perfect drainage the lymph capillaries afford the tissues, and the mechanism by which the products absorbed by the capillaries are passed on by muscular contraction to the larger vessels *en route* to the point of elimination.

The lymphatic glands are now confidently claimed to be the points of origin of the white blood corpuscles—or phago-

cytes—and Metchnikoff was the first investigator to direct particular attention to the important part played by these lymphocytes or corpuscles in maintaining health and destroying pathogenic germs.

Here it may be mentioned that the general tendency is to overlook the absolute importance of the lymph flow of the body, and to think of the blood as the sole nutrient fluid of the economy, but the fact is that the blood nourishes the tissues only through the agency of the lymph. Sir Michael Foster calls lymph the "middle man," by means of which a double interchange of material takes place between the blood within the capillaries and the tissues outside of them. The rapidity of the process can be partly comprehended by the fact that it is estimated that the entire volume of blood passes through the lungs once in every twenty-four seconds.

In addition to giving origin to the lymphocytes and acting as temporary reservoirs for the lymph, the glands also drain the tissues adjacent to them, and are consequently important factors in the process of absorption.

Lymph comes into more intimate relation to tissue metabolism than even the blood, conveying as it does nutriment to the tissues, and receiving from them in return the products of cellular activity. Lymphatic glands are therefore both secretory—producing the lymphocytes which become converted into phagocytes after passing into the blood—and excretory—draining the waste matter from contiguous tissues and discharging them into the circulation; and both of these functions are performed simultaneously. They are prone at times of lessened vitality to become overloaded with waste or poisonous products, which partly inhibits their function.

These glands, although rather sluggish in their natural action, are highly responsive to stimulation, and their excretory function may be very materially increased thereby. There is but little doubt that their natural torpor arises from the toxic effect of the waste and deleterious matter which drains into them from the

surrounding tissues, and for which they act as reservoirs.

From this rather hasty review of the structure and functions of the lymphatic system, it will readily be seen that it is of supreme importance in the general metabolism of the body, and the perfect functioning of the economy depends absolutely upon the integrity with which the lymphatic system performs its dual office.

Now as to the therapeutic aspect of the subject. The results obtained from the practice of vibratory massage by the most competent practitioners may be epitomized as follows: (a) Energetic stimulation of the lymphatic and arterial vessels and glands; (b) Dispersion of exudations; (c) Increased secretions of the mucous membranes and glands.

As a general proposition it may be said that the method can be used with the greatest success in all subacute and chronic diseases. Dr. Lorenz has recommended it in chronic joint diseases, and has also suggested its employment after any operation in which it is desired to increase the nutrition of the part and to hasten recovery.

Dr. S. J. Meltzer of the Harlem Hospital, New York city, has stated, as a result of a series of experiments, that the growth of bacteria is absolutely inhibited by continued vibrations. Similar reports have been made by foreign investigators.

In view of such a range of therapeutic activity, the application of this method to the treatment of pyorrhea alveolaris and alveolar abscess is apparent.

In the treatment of pyorrhea alveolaris, after the thorough scaling of the roots of the affected teeth and the complete disinfection of the pockets with iodine, zinc iodid, or any of the acids used for the purpose, the patient is ordinarily dismissed with more or less explicit instructions to take excellent care of the teeth and mouth. This is where a mistake is ordinarily made. The operator should not dismiss the patient until after the complete convalescence of the gums, and until he is assured that the care he has advised is exactly suited to the individual case under treatment. This care

should invariably include stimulation of the lymphatics of the gums by massage, administered by either patient or operator or both—the patient using either a rubber cot brush, towel, or finger; the operator at such intervals as his judgment dictates either applying or advising the application of mechanical vibratory stimulation by the appropriate apparatus—a variety of which have been placed upon the market.

Thus the lymphatic system of the gums will be kept so active that exudations will be either prevented or more readily absorbed, and the progress of the disease will be reduced to a minimum.

I tell patients suffering from this disease that the amount of trouble they will have from it will bear a persistent ratio to the lack of personal care and professional treatment—emphasizing both personal and professional treatment as of equal importance, each one supplementary to but under no circumstances a substitute for the other.

When the common membrane of a tooth and its socket becomes inflamed from any cause and its structure infiltrated with serum, how is the surplus serum—that amount in excess of what is needed to repair the parts or restore them to a normal or approximately normal condition—how is that excess to be disposed of? By one of two methods; either the lymphatics of the adjacent tissue must absorb it rapidly enough to prevent disintegrating changes taking place, or else the accumulated serum becomes the pabulum of an innumerable host of pyogenic organisms and an abscess results, with or without a fistula, according to the vitality of the patient or the activity of the lymphatics involved.

As to the best method of allaying periodontal inflammation and absorbing the prospective abscess in such cases: If there is any better method than that of first removing the cause, and then stimulating the adjacent lymphatic glands, it would seem that it is yet to be generally learned.

Simply removing the cause will result in a slow cure for the majority of cases, but as the average practitioner always

succeeds in a majority of his cases, we can consider that it is the minority that tests his therapeutic wits, and it is in reducing that difficult minority that lymphatic stimulation gives most brilliant results, and successfully carries a precarious case to a speedy convalescence a sufficient number of times to justify the administration of the treatment in all indicated cases.

In those cases of acute alveolar abscesses presenting for treatment at that stage where the lightest touch is agony for the patient, the quickest method of checking the inflammation and reducing it to the point of permitting instrumental cleaning of the root-canals is to subject the affected side of the jaw to several exposures of blue- or ultra-violet light rays, at the same time applying the rubber applicator of an electrical vibrator to the cervical lymphatic glands of the same side.

In lieu of either or both of the above-mentioned methods, it is well to instruct the patient to refrain from putting any sort of application on the face, but to sit, if possible, with the affected side exposed to the direct rays of the sun for five or ten minutes several times a day, and to stimulate the cervical lymphatics of that side by the use of a little hand rubber massage mallet—or even an ordinary hollow rubber ball inclosed in a handkerchief could be used for the purpose. One to two hundred quick, gentle strokes are usually sufficient for one of the two or three treatments necessary. In unusually severe cases the patient may be instructed to stimulate the axillary lymphatics of the affected side in the same way.

Aside from the positive benefit that results from these measures, the patient's attention is diverted from the seat of trouble, and he is kept busy with a process that gives relief in proportion to the enthusiasm of its administration.

It is now universally admitted that the exposure of any infected tissue to the sun's rays unquestionably inhibits, and in many cases of continuous exposure destroys, the pathogenic bacteria present—the sun being the world's greatest germicide—while the judicious stimulation of

the lymphatics contiguous to the affected area increases both their power of drainage and the process of phagocytosis.

These remedial measures are suggested, and have been successfully used in personal practice, in addition to the classical local treatment in general vogue for the pathological conditions mentioned. There is no intention whatever of offering any substitute for thorough and painstaking local work on affected teeth, but rather that we should add to our present methods additional means of more speedily accomplishing the return of diseased conditions to the highest degree of normality possible under the circumstances. In conclusion, it may be said that experience justifies us in not expecting to obtain uniform or invariable results from any therapeutic system; and lymphatic stimulation through mechanical vibration, like all other therapeutic measures, demands for its successful application a sound pathology, accurate deductive reasoning, and good common sense. While we cannot positively accept all that has been asserted regarding its field and its possibilities, neither can we reject it, and further observation will be required before a final decision can be reached.

The hope is expressed that this article will at least prove fertile in its suggestiveness, rather than in its supply of specific detail.

Discussion.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I have always been pleased with Dr. White's work in dental surgery, as he exhibits a very high type of excellence in whatever he does. I had the pleasure of seeing one of the cases exhibited on the screen, and I can say that the results were very satisfactory indeed, from the standpoint of my judgment. I think, however, that the principal value of Dr. White's paper, added to its pleasing presentation, is the very marked suggestion that he threw out—alluded to also by Dr. Rhein—as to the importance attaching to the question of differential physical diagnosis. I am very well satisfied that a great many of the cases that come under the care of the dental sur-

geon could be treated by pursuing a more conservative course. I think there is a tendency to go a little too far, owing to the anxiety and the enthusiasm of the dental surgeon.

If I understood Dr. Rhein correctly—in which case I must hold that his teaching is erroneous—the gist of his remarks was that it is a very common thing for the apical end of a root of a tooth to be bathed in pus with a living pulp in it. According to my experience clinically, I must say that it is a very rare thing for the end of the root of a tooth to be enveloped in pus and the pulp remain living in that canal. I do not pretend to say that such a thing does not exist as a pus-investment of the entire end of a root of a tooth, and yet vitality remain. The vital structures, and particularly the nerve tissue, are remarkable in their power of resistance to the progress of disease action as a rule; but how often have the older practitioners seen the vitality in the palatal root of an upper molar destroyed and a provisional zone of partition thrown across the pulp-chamber, and the two buccal roots living. All men have seen that who have been long in practice. Show me a dental surgeon who has not observed such conditions, and I will show you one who either has not had much practice, or else he is a very poor observer. These things do occur, gentlemen, but to say that they are common occurrences in practice is erroneous teaching.

With regard to the diagnostic value of the radiograph: If I understood him correctly, Dr. Rhein said that by means of the radiograph he proposes to show the different pathological changes taking place in the tissues within the time covered by that radiograph. Later on he told us that that white zone or field was an indication of pus. Now, gentlemen, if that be true in every picture that he showed us, there was pus all around the teeth.

I was very much interested in the composition and statements made in that last paper, for if there is anything in the world I like, it is clinical reports. Not many practitioners know how to make

a clinical report. The average person presenting a case announces the diagnosis and then reports the case. He should first report the case, and then give his opinion as to the diagnosis. Why? Because you should want everybody to study the case with you. I tried to cultivate my powers of diagnosis in keeping with the valuable suggestions of Dr. Rhein, and by listening to the statements he made and looking at the pictures, tried to make up a diagnosis of the cases, but he gave his diagnosis before he told us all.

When Dr. Allen read his paper, I tried to determine whether it was hydropathy or osteopathy, or what it was he was teaching, but I do not know. But I will tell you, gentlemen, if I had a case of pulpitis that was not amenable, not in a few days but in a few minutes—a case where the lymphatics were involved—well, bring such a case in here to me tonight, and if I don't afford relief to that case in twenty minutes, I will quit practicing dental surgery. How many dental surgeons have not had many cases of the type he presented here tonight, which were the result of pent-up pus! One step more, clinically: I do not believe that the surgeons of the world, and particularly the dental surgeons, have ever grasped the significance of the immense amount of force developed in the process of inflammation that takes place in and around the teeth. The amount of force developed in the process of inflammation and the formation of an abscess is often sufficient to burst a tooth, and many teeth are split open under it. Has not every dental surgeon observed what I call your attention to tonight? If not, one of two things is sure; either he has not had much experience in such cases, or he is a very poor observer. Every dental surgeon has opened an upper lateral incisor and seen the pus come boiling out. Perhaps in another case they will open a tooth and the pus will not come out. Why? The elasticity of the structures around the tooth has been so overcome that they do not respond; while in the other case the structures are so elastic that they squeeze the pus out. Every practitioner has seen this. Now, instead

of pummeling that fellow with a sore jaw, give vent to this pus area, and let nature do the rest.

Dr. M. F. FINLEY, Washington, D. C. I would like to say just a word, not so much on the paper as on the last discussion. It seems to me that our friend Dr. Crawford has misinterpreted the cause of pain in the cases that the essayist presented. In a great many cases pain is present when there is no pus, or we might say with certainty that in the majority of cases where pus has formed the pain ceases. The stages preliminary to the formation of pus are the ones in which the greatest pain is encountered. I think it is quite reasonable in a discussion of this kind to give credit for discrimination in the diagnosis to the one who prepares and presents a paper. One of the greatest drawbacks to successful practice is the failure to make a proper diagnosis. Dr. Crawford would have us believe that all cases of pain result from pent-up pus, when in reality there is nearly always a cessation of pain when the inflammation has existed sufficiently long to produce pus. It is to stop the inflammation in its early stages that the treatment suggested by the essayist is here offered, in the hope of cutting short suffering and pain. Our main effort should always be to give relief at the earliest moment possible, and it seems to me a plan is here suggested which will improve our present methods. It is worthy of careful consideration.

Dr. H. T. STEWART, Memphis, Tenn. I have listened to a good many discussions on Riggs' disease, or so-called pyorrhea, but I have not heard in a long time so interesting a discussion as we have heard tonight.

I want to take exception to two or three things; one is that in Dr. White's paper, as in nearly all papers on Riggs' disease, we find emphasis is laid on the removal of deposits. I have always asserted that this is not the chief thing in the cure of the disease. I used to think that it was deposits, and I labored to remove the deposits only. They assuredly should be removed, but men who remove deposits only, do sometimes what we do not take into question—they tear up the

tissues and stimulate new tissue, and afterward apply stimulating medicines to the edges of the alveolar border. I have experimented a great deal along this line, and in a great many cases I have tried to see what results I could get by leaving the deposits alone, and have often obtained results that would astonish me.

Another thing: I think it is altogether wrong to assume that it is local treatment only to which we should direct our attention. I believe that is false teaching. A good many years ago, when I read my first paper on Riggs' disease—and by the way I want to say that I object strenuously to the name pyorrhea as being misleading; and while I do not like the name of Riggs' disease, it is at least not misleading—I stated that in a large percentage of cases we have no pyorrhea at all, but in Riggs' disease we cover the ground. Whether there is pus present or not, it is Riggs' disease. I wish we had a better name, but we have not. Dr. Noel took me to task at the southern meeting in Memphis last year for calling this condition Riggs' disease. I asked for a better name, but Dr. Noel has not given us one. Some present have heard me before cite some cases in which the catarrhal conditions prevented the cure of the case. I want to say today that the catarrhal condition of the mucous membrane of the mouth in the treatment of Riggs' disease is something that cannot be controlled by lactic acid or the removing of the deposits; this is something that is not taken into consideration as it should be, and consequently accounts for the return of the disease in many instances.

Dr. Noel says it cannot be cured, but I say that it can be cured. I remember one case that I treated in which I obtained very good results at first from local treatment, but the patient returned. A specialist from New York city examined the case and found a deflected septum, which caused the man to breathe through his mouth, producing an unnatural condition which kept the mucous membrane of the mouth irritated, and which prevented the cure of the disease. It was easy to cure

after the man was operated on, and his normal breathing restored.

Dr. White says he gives very few drugs. I think it is a good thing to give drugs when it is essential. Several years ago I was a most radical advocate of local treatment, but the more I see of this disease the more I am inclined to enter into the systemic treatment, with the aid of the physician when necessary. Dr. White also speaks of flushing the sewers and getting the patients to drink water—cold water I believe he said. Is that right?

Dr. WHITE. Yes, cold water but not ice-water.

Dr. STEWART. That is a good thing under certain circumstances, but there are other parts of the body to be considered besides the sewer. Nature calls for water when she needs it, and the way to get patients to take large quantities of water is to have them take plenty of exercise. But the thing to be impressed is this: they should not only drink water, but should put their bodies in a condition to call for water. The skin should be stimulated and the blood given free circulation, and then you naturally drink water and in that way flush the sewers, and not only them, but the bloodvessels, arteries, and the veins. I have seen serious systemic disturbances follow the drinking of large quantities of cold water in trying to flush the system. If it be necessary to drink large quantities of water, it should be hot water, as a rule.

Speaking of systemic conditions and systemic treatment reminds me of a case I have reported several times, that of a banker; and, by the way, there were no deposits on these teeth whatsoever, and yet it was one of the worst cases of Riggs' disease I ever saw. How are you going to cure a case of that kind by simple local treatment—by removing the deposits? I treated the case, meeting with fairly good success, and thought I was getting along beautifully, when after a little while I had a reverse; there was a profuse flow of pus that I could not manage at all. The patient was living an indoor life; I tried to scare him into getting out of doors, by telling him that not only his teeth were concerned in the

matter but his entire well-being. He began to take outdoor exercise for two or three hours a day, and I again had fairly good success. However, in the course of two or three months he returned to me with his mouth in possibly a worse condition than it was in the beginning. I tried almost everything I could think of, and at last I put the man on colchicin—something we know very little about. We do not know the effect it has on the system, but we do know that when used empirically it often has a wonderful effect on gouty conditions. That was about five years ago, and that procedure, together with the local treatment, produced a cure, and we have had no further trouble from the case since.

One of the gentlemen sitting near me tonight called to my attention a case that I mentioned before a dental society some time ago. It was the case of a man who had suffered from Riggs' disease for several years, until he became discouraged. He came to me and I began local treatment, but met with very little success. I inquired into his habits, which seemed to be perfect. He was almost a model man—did not smoke, kept regular hours, took a great deal of outdoor exercise, living out in the country—and I could not account for it. He seemed to have no particular ailment, and in obtaining his family history, I questioned him as to his diet, and was told he was very fond of molasses. I asked him how fond he was of it, and he told me he ate it three times a day and a great deal at every meal—that he could not do without it. I suspected that that was the trouble, and I at once cut off the molasses, with but simple treatment, and the man recovered. Dr. Johnson told me shortly afterward that he had heard of many fiendish operations, but he had never before heard of cutting off a man's molasses in order to cure his Riggs' disease.

Dr. WHITE (closing the discussion of his paper). I thank the association very much for the kindly way in which they have received my paper. I am free to confess that I am somewhat of an enthusiast on the subject of pyorrhea, and while Dr. Noel does not agree with me

as to its cure, I still believe nevertheless that it is like many other diseases in that respect. Pyorrhea develops under certain conditions, just as other diseases do; when we change these conditions and treat the patients, we cure the disease. If the patient is negligent and adopts a careless way of living, and drifts back into this same condition—in other words the condition that produced that disease originally—he will naturally have a return of the disease. As I said in my paper, you would not say of a patient coming from a malarial district, that he could not be cured; for if you change the conditions and climate he will be cured, while if he goes back to a malarial district he may have malaria again. So with many other diseases, and this has been my observation with regard to pyorrhea.

As regards Dr. Rhein's radiograph, I think there is possibly a field for it in the study of diagnosis, but I also think that it will have to be developed to a very much greater degree than it is at the present time. I have for a long time hoped that we might have a light of some kind which we could pass immediately back of a tooth, and so locate perfectly the place where the deposits happen to be. It may be that the radiograph will reach that state of perfection where it can be depended upon, but I do not think at present that the radiograph is distinct enough to be of very much value to us in the diagnosis of pyorrhea. There is no question that it is a very valuable adjunct in surgery, and also in dental surgery in locating impacted third molars and unerupted teeth.

Dr. G. V. I. BROWN, Milwaukee, Wis. I am very glad to say that I have seen these cases of Dr. White's, and I want to say that they look better in the mouths than on the screen. Such results as I have seen in Dr. White's office I think I have never met with anywhere else, especially when I have had the opportunity of discussing with the patients the changes that have taken place in their conditions during the course of five, ten, and fifteen years after the treatment. I was glad to have Dr. Allen bring the suggestion to this section along the line

of this paper. It is not a question of how to bring about this lymphatic stimulation, so long as you do bring it about. We have had several papers before the section, and it occurs to me that this is a timely thought that we have our attention directed along that line.

Dr. ALLEN (closing the discussion of his paper). Dr. Crawford misinterprets my ideas, as I never thought of advocating the stimulation or the pounding of inflamed tissues; that I would consider malpractice. I spoke only of stimulating the contiguous tissues. I said common sense, deductive reasoning, and sound pathology would be necessary in order to have good results from this treatment. One who did not know thoroughly what he was doing would get himself and the patient into trouble by the careless or thoughtless application of such methods as I have advocated, and I am glad to make this point clear, that any direct stimulation of diseased tissue is likely to make the condition worse. We want to draw away the serum that results in pressure on the nerve filaments and causes pain, whether an abscess threatens or not. I thank Dr. Finley for emphasizing the fact that where there is pain there is not always necessarily pus. When the adjacent lymphatic glands of any inflamed tissue are stimulated, then unquestionably the inflammation will be affected to the same degree that the glands are stimulated. There is, however, a point beyond which the glands should not be stimulated—a point at which stimulation ceases and irritation begins; and there the questions of common sense and the personal equation of the operator become paramount. I may say that my ideas are yet imperfect, and I hope some day to present clinical examples, and make more clear the ideas that I am now struggling with.

The next order of business as announced by the chairman was the reading of a paper by Dr. E. P. DAMERON, St. Louis, Mo., on "Oral Hygiene in the State Association." Dr. Dameron was not present, and his paper was read by Dr. J. P. Corley. An abstract follows:

ORAL HYGIENE IN THE STATE ASSOCIATION.

The state association is of the greatest importance to the dental surgeon and to the public. To the dental surgeon it is, in a way, a clearing-house, where practitioners from all sections of the state assemble and old and new subjects in dentistry are reviewed. This interchange of thought and the demonstrations of operative and prosthetic work are of undoubted value, and as the dental surgeon is benefited, so in turn is the public benefited. The time is approaching when every active member of the profession will be expected to belong to his state society, and will be looked upon with suspicion by his patients if he does not.

Dentistry as a profession is advancing with rapid strides, and he who fails to keep in touch with his fellow practitioners will soon be left behind by the onward march of progress.

One of the many topics that is receiving much attention is that of the preservation of the health of the teeth and mouth. Endeavoring to learn what work had been done along this line in the past year, programs of state society meetings in fourteen states were examined, and in each of six of these was found at least one paper or clinic—sometimes more—upon the subjects of oral hygiene, prophylaxis, and care of the teeth, being nearly fifty per cent. of those at hand—a very encouraging outlook. Several state associations have a permanent committee on oral hygiene, as should every state, sectional, and national society.

More attention, however, is as yet given to operative and prosthetic technics than to prophylaxis; more to restoration than to prevention, and this condition will probably continue until the thought "clean teeth do not decay" is instilled in every person. Every individual should know that by his own negligence he is subject to inconvenience. A majority of the people of high and low degree are not sufficiently interested in the care of their teeth; oral hygiene is not widely known and fully appreciated by them, but should

it become popularized, instruction would be more sought after than disregarded.

In the advancement of oral hygiene three things in particular are to be overcome: (1) Lack of care in parents or guardians; (2) lack of interest, and perhaps knowledge, on the part of the family physician; (3) lack of instruction and training by the dental surgeon. Indifference, ignorance, and prejudice in parents often prevent the benefits that might be derived by children from proper education in the public schools upon this subject, and yet there is perhaps no better way to overcome these obstacles than by persistent and careful instruction.

Every state society should endeavor to have oral hygiene taught in the public schools of its state. Much good has already resulted from such action. The medical profession has not given the care of the teeth and mouth as much attention as should be given to this subject, but many medical schools have arranged for lectures upon dental topics, so that in the future there may not be so much lack of interest and knowledge by those who enter the practice of medicine. Those already engaged in practice are not to be reached in this way, however, and there could be no better way than that the state dental association memorialize the state medical society, calling special attention to oral hygiene, prophylaxis, and dental pathology.

In a general way most of us have practiced prophylaxis, but systematic care of the teeth and mouth with a view of prevention of their affections has been advocated for comparatively but a few years. As our knowledge of disease increases, the truth of the old saying "an ounce of prevention is better than a pound of cure" becomes more and more apparent. Preventive dentistry is now advocated by many of our progressive dental surgeons, who through prophylactic and hygienic measures have accomplished much toward decreasing, if not preventing, caries of the teeth, in many instances reducing carious action fifty per cent. and reducing the number of other oral ailments to an even greater degree. But there are many engaged in the practice of dentistry who

do not attend society meetings, and seldom, if ever, read a dental journal; thus within the confines of our own profession we find a large field for missionary work. Oral hygiene as advocated today is unknown by many. How then can they give proper instruction and training to those coming to them for treatment? There can be no doubt that it is the province of the state association to look after these indifferent brothers, and for the good of the public supply them with information pertaining to this subject. Many state societies, as already stated, have a standing committee on oral hygiene, but in many instances a "walking delegate" with a "big stick" would be required to spread our gospel.

The general apathy of the public concerning the care of their teeth and mouth is to be deplored, but in a measure is excusable; but apathy in a member of the profession is inexcusable, and cannot be too strongly condemned. While many state societies are endeavoring to spread a knowledge of oral hygiene and the outlook is most favorable, they are somewhat impeded by lack of official literature upon the subject, and it would no doubt be a good plan for the National Dental Association to supply the text of a treatise upon oral hygiene and prophylaxis, which the various state societies could adopt, and urge upon boards of education to adopt as the standard in dental instruction.

To arouse and stimulate interest in this subject among members of the profession, each state association might arrange an essay contest, in charge of the oral hygiene committee, the essayist receiving the highest number of points to be rewarded by a special vote of commendation by the society—or by any plan the society saw fit to adopt. The essential thing is to create interest in oral hygiene in the profession, in the medical profession, in the schools, and in the home.

Articles upon the care of the mouth and teeth are appearing with increasing frequency in many periodicals throughout the country, indicating a growing appreciation of this work.

Section III then adjourned.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICES, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canada, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the Editor, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, MARCH 1907.

EDITORIAL DEPARTMENT.

THE CODE OF ETHICS.

THE time seems to be ripe, or at least it is ripening, when it might be desirable to seriously examine our code of ethics. We have a code, to be sure: occasional reference is made to it in the routine transaction of society business; a standing rule of the National Association makes it necessary that every society sending delegates to the national body shall subscribe to and maintain the provisions of the code; once in a while the code is published; nearly every practitioner has heard about it, but not one in a hundred, we venture to state, has ever read it carefully and thoughtfully. We would go farther and express the belief that but few relatively have any clear concrete idea concerning the meaning of professional ethics, or even so much thereof as the code embodies.

We are of this belief because "ethics" and "ethical" are terms which have suffered much the same sort of maltreatment that has been visited upon the terms "science" and "scientific."

We have the science of whitewashing, of pugilism, of base-ball, of bridge whist, of tight-rope walking, fly-fishing, golf, and target shooting. We have Christian science, so called, possibly on the same principle that we call ferrous sulfate copperas—doubtless because it contains no copper. So by the same type of inverted logic we have ethical dentifrices, ethical anesthetic agents, ethical nostrums and appliances, from a whirling spray to a cervix clamp, which one may purchase *ad libitum*. All of which indicates that it is high time to take our code of ethics out of the archives, dust it off a bit, and see whether it really is a code of ethics, and how fully it measures up to the needs of this later generation of practitioners that is making such liberal interpretations of the term ethics and giving it such a variety of novel applications.

Ethics in its broad sense being the science of right conduct and right character, then dental ethics becomes merely the application of this doctrine to the special case of dental professional relations. Unfortunately our code has attempted to deal only with the conduct and character of the dentist in the strictly professional sense as a professional or business man, and not as a human being, a social unit incidentally practicing dentistry. It has apparently taken for granted, for the most part, that the ethical considerations which should in general govern a man's relations to his fellow men need not be repeated in the professional code. This omission we deem to be unfortunate. Why, if the code is to serve as the standard of ethics in dentistry, should it not be more comprehensive in its specifications, if it is to contain any specifications at all? It is true that the code distinctly states that "The person and office arrangements of the dentist should indicate that he is a gentleman, and he should maintain a high-toned moral character"—which is indeed the essence of the whole matter, for on this commandment hang all the other articles of the code. But in view of the multiplicity of conceptions as to what constitutes a gentleman, the framers of the code evidently believed it to be necessary to particularize a few instances of misconduct which fall under the ban of unprofessionalism, and it is curious to note that nearly every one of these particular specifications has a bearing more or less direct upon the monetary aspect of professional work.

It is pronounced by the code to be unprofessional to resort to public advertisements calling attention to peculiar styles of work, prices for services, or special modes of operating, or to claim superiority over neighboring practitioners, to publish reports of cases or certificates in the public prints, to go from house to house soliciting or performing operations, to circulate or recommend nostrums, or to perform any other similar acts. The next following section of the code provides that no dentist shall do any act that will tend to take a patient away from a colleague; and the concluding section of Article II provides for the maintenance of the standard fee bill agreed upon by practitioners of a given locality. The other articles of the code are general in the character of their provisions.

The two features of the code which we regard as being open to criticism are its failure to include definite specifications as to the foundation principles that go toward the making of professional character, and the undue emphasis that is particularly placed upon that type of wrong-doing which is an offense because it strikes at the pocket-book rather than at the character of a colleague. We are of opinion that the code should be amplified and made more specific upon the several ethical points with which it deals. We are of that opinion because, notwithstanding the fact that over nineteen centuries have elapsed since the enunciation of the ethical principles which we claim to accept as the basis of our civilization, it is nevertheless true that those same principles which we pronounce so trippingly on the tongue are not even yet the true coefficients of our social order; and it thus remains also true that the greatest sympathetic nerve of the human organism has its deep origin in the pocket-book.

One cannot fail to note the emphasis which the code gives to all misdemeanors involving the filching of his neighbor's business, and its lack of emphasis upon all matters relating to the filching of his character. With the former wrong it deals specifically and at length; the latter it dismisses with glittering generalities. If the code simply required that a dentist should be a gentleman and live up to the standard of the golden rule it would have amply covered the ground; but in its attempt to paint the lily, to improve on the most comprehensive ethical precept given to man, it has muddled the case badly by entering

into particulars, choosing as the most important for specification those acts of unprofessionalism growing out of individual greed for the property or material possessions of another, while referring only indirectly to all other and more important ethical considerations by requiring that the person and office arrangements of the dentist should indicate that he is a gentleman. Would it not be as well for the code to practically recognize the professional importance and applicability of the ethical principle laid down in the command "Thou shalt not bear false witness against thy neighbor" as it is to enforce the command "Thou shalt not steal"? It is true that the code provides that a dentist's person and his office arrangements should indicate that he is a gentleman, but why treat the point involved in such a stepmotherly manner? Why not say that a dentist's acts as well as his professional surroundings should demonstrate that he is a gentleman. Surely there is abundant need for the propagation of a larger meaning for the phrase "professional ethics," and something more definite should be done to emphasize the importance in everyday professional life of the principle set forth in the ninth commandment of the Mosaic code.

To those who know and appreciate the full force and meaning of the word *gentleman*, and live up to that standard, no other code of ethics is needed; but unfortunately the spirit of the Pharisee is still in evidence, and for the ethical control of that spirit in humanity, even in professional humanity, a specific code is necessary—one that deals not only with principles but which particularizes the application of those principles.

For these reasons we regard our present code of ethics as imperfect because it fails to reach the real sources of professional wrong-doing, and because it is concerned mainly with protecting the material business interests of the profession while neglecting the conservation of professional character individually and collectively.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zürich, January 1907.]

ON CERTAIN SPECIAL FORMS OF NECROSIS OF THE MAXILLÆ. BY DR. MAURICE ROY, PROFESSOR AT THE ÉCOLE DENTAIRE OF PARIS, DENTIST OF THE HOSPITALS, ETC.

The type of osteitis which leads to necrosis of the maxillæ may be due to various causes, among which those of dental origin are the most frequently encountered. Osteitis of the jaws of purely dental origin evolves in ways which vary according to the character of the tissues in which it arises, and of the causative microbic elements. The author reports in detail three cases of maxillary necrosis as representing three different types of the disturbance under consideration. The first case was that of a man, thirty-nine years of age, of excellent clinical history, whose teeth—both upper and lower—were free from caries. The onset of the disturbance was marked by the discharge of pus through a fistula, the outlet of which was situated below the lingual surface of the crown of the lower left first bicuspid. The concealed abscess had to all appearances healed about twenty-four hours after the beginning of the discharge, but it had cut short the life of the tooth, which was found to be very loose and surrounded by inflamed and receded gum tissue. The same condition of things repeated itself in the case of every tooth on each side of the bicuspid, and eventually caused the shedding of the teeth from the lower left third molar to the lower right second bicuspid inclusive. All possible efforts on the part of Dr. Roy and associates—efforts therapeutic and surgical—were of no avail in averting the trouble, which came to a halt following a rheumatic periostitis of the ascending mandibular ramus. The history of the case is peculiar on several accounts, and

its etiology rather obscure, as there were no carious cavities in any of the affected teeth, and also because any other plausible cause of maxillary necrosis—including actinomycosis—could not be detected. The patient was of the rheumatic diathesis, and in view of the occurrence of a rheumatic periostitis and of an attack of general rheumatism—the latter coincident with the onset of the disturbance—a diagnosis of rheumatic osteitis of the mandible was reached. It is noteworthy that while the usual oral manifestations of rheumatism are in the form of pyorrhea alveolaris, recession of the gum, alveolar resorption, loosening of the teeth, and occasionally small sequestra, in the case under consideration the teeth themselves were not affected, as the entire series of pathologic phenomena was localized in the mandible and alveolar ridge.

The second case was that of a man twenty-four years of age, who had been suffering for some time from abscesses in the maxillæ, and, more recently, from nasal suppuration. An examination of the mouth showed that the mucous membrane above the incisors and canines was violaceous, and revealed the presence of two small fistulæ above the lateral incisors. All the upper teeth were of healthy appearance, although the incisors and canines—especially the central incisors—were movable. The teeth were of uniform grayish color, and consequently it was difficult to ascertain the condition of the pulps of the affected teeth. There was no history of traumatism. An explorer introduced into the fistulous tracts was found to penetrate into soft, spongy tissue. The exploring operation was followed by slight hemorrhage from the mouth and nose, and a second examination showed that the mobility of the teeth was due to the mobility of the surrounding bone area. The gingival mucous membrane was of normal appearance and closely ad-

herent to the necks of the teeth. The disturbance had been going on for several months, and during all of this time had not given rise to any painful sensations, the patient, as a matter of fact, being discomforted only by the persistent and ever-increasing suppuration.

The progress of the disease and its general aspect pointed at once to a diagnosis of tuberculous necrosis, particularly in view of the fact that the general appearance of the patient, as well as his antecedents, tended to corroborate this diagnosis. A general examination of the patient confirmed the diagnosis in so far as it brought out the existence of pulmonary lesions. The foregoing data, and in addition the caseous character of the bone, made it possible to confirm the diagnosis. In view of the absence of carious cavities—the ordinary avenue of penetration of the tubercle bacillus—it is not perhaps unreasonable to suppose that the tuberculous osteitis of the mandible had originated in an intranasal infection. The patient was successfully operated upon, and while both the general and local condition improved steadily, the general tuberculous infection eventually carried him off about five years after the operation.

The third case reported by Dr. Roy was that of a man twenty-six years of age, in whom the infection of the pericementum of a lower left bicuspid spread to the periosteum of the jaw with such an intensity as to bring about in several days the necrosis *en masse* of almost the entire osseous area, from the lower left first molar to the canine of the same side. Nothing in the general condition of the patient was found that could have been considered as a factor in the etiology of the lesion, which as above stated, was the outcome of the invasion of the maxillary periosteum by some virulent forms of microorganisms.

[*La Revue de Stomatologie*, Paris, November 1906.]

ON A RARE COMPLICATION OF PYORRHEA ALVEOLARIS. BY DR. V. GALIPPE.

The author relates the case of an aged patient, of pale and waxy complexion, who for a long time past had been suffering from chronic enteritis. At the time of the exami-

nation by Dr. Galippe, he was just recovering from an attack of the grippe, and presented in addition to an intense pharyngitis and a pyorrheal condition, a peculiar form of gingivo-stomatitis, which has not been thus far reported or observed. Around the teeth, and in particular at the level of the upper left second molar, were a number of opal-colored plaques, easily detachable and reproducing themselves by auto-inoculation from the upper to the lower jaw. At first, judging from the general condition of the patient, the author believed that the disturbance was of the nature of a superficial sphacelus. There was absence of fever, and when the membranous plaques were removed the underlying mucous membranes appeared, although intensely red, by no means deeply ulcerated.

The antiseptic treatment which was instituted was not followed by the rapid improvement which had been anticipated, and the membranous plaques continued to grow and multiply, although the newly formed ones were smaller and fewer. In view of these developments the original diagnosis had to be modified, and in order to obtain a clearer view of the case Dr. Galippe requested Dr. Malassez to examine the false membranes, which he himself thought at first to have been constituted by the buccal mucous membrane. After repeated examinations Dr. Malassez reported that the membranes were composed exclusively of white blood corpuscles, and that they contained no connective tissue, vessels, or glands. At different areas of each membrane microbic agglomerations could be seen, but the exact nature of the microbes could not be detected through the microscopic examinations alone. It was not the mucous membrane that had undergone a necrobiotic process, neither were there eschars, as are usually formed consequent upon inflammatory disorders of microbic origin in the mucous membrane of these regions. The plaques were precisely of the nature of false membranes.

In the meantime the patient left the city on an extended trip, and upon his return, conditions had so far improved that a painstaking bacteriological examination by Vincent, the well-known authority on the bacteria of the oral cavity, resulted in the isolation of the pyogenic cocci and of a non-pathogenic anaerobic bacillus. The author of this re-

port considers it advisable to record this observation, notwithstanding the regrettable fact that the true cause of the production of the membranes still remains unknown. It may at least serve the purpose of preventing an erroneous diagnosis should similar cases occur in the future.

[*Semaine Médicale*, Paris, July 18, 1906.]

COCAINIZATION OF THE INFERIOR DENTAL NERVE FOR THE PAINLESS EXTRACTION OF MANDIBULAR TEETH. BY DR. NOGUÉ.

The author anesthetizes the inferior dental nerve by the method described in the recent thesis of Dr. Pageix. The injection may be performed by means of a Pravaz syringe and the ordinary hypodermic needle, but it is advisable to employ a cannula of about 7 cm. in length, bent to a bayonet shape, and provided at its free end with a needle of about 1½ cm. in length, in lieu of the hypodermic needle of regulation size and form. The point of election for the injection is ascertained by introducing the index finger into the mouth, and carrying it as far as the anterior border of the ascending ramus, when by slightly moving it toward the opposite side of the jaw, it will encounter a ligament offering a high degree of resistance to any effort to displace it. This ligamentous structure is the internal pterygoid muscle, and in the groove between it and the internal surface of the ramus is found the path of the inferior dental vessels and nerves. The needle should be introduced at a point as close as possible to the osseous structure of the jaw, and from 1 to 2 cm. of a 1 per cent. solution of cocain hydrochlorid injected into the tissues.

At first but a portion of the solution is injected, the remainder being expelled from the syringe after carefully moving the latter toward the labial commissure of the opposite side, in order to thus bring the point of the needle in closer proximity to the nerve trunk. From three to six minutes after the introduction of the injection the patient experiences a feeling of formication on the corresponding side of the lip and jaw, and shortly afterward the entire region which has been the seat of the formication becomes absolutely anesthetized, and remains so for an interval of about twenty minutes.

The failures which have been observed with

the method under consideration—about one-third of the cases in which it has been used—have been due, in the opinion of the author, to an imperfect technique, and the only accident that has been recorded up to date was a temporary contraction of the muscles of mastication, caused by the puncturing of the internal pterygoid muscle with the needle.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, August 11, 1906.]

ECZEMA OF THE LIP AND THE RÔLE OF CERTAIN MOUTH-WASHES IN ITS ETIOLOGY. BY ALBERT REISSNER, MUNICH.

Ecze-ma, in the etiology of which the ingredients of mouth-washes play an important rôle, is not so rarely met with as Galewsky of Dresden is inclined to believe. The author has observed eighty cases of lip eczema, and reports upon them, especially in their bearing upon the central subject of his investigations, namely, the rôle which certain mouth-washes may play in bringing about the disorder.

It occurs with greater frequency in the autumn months, particularly in women of very thin skin, who are liable to suffer from cracked or fissured lips. In almost all cases the onset of the disturbance is marked by redness and swelling of the lower lip—extending quite frequently to the labial commissure—and by pain and a sensation of tension. As in all cases of eczema, desquamation soon follows. Galewsky mentions fissures of the lip as one of the symptoms of labial eczema, whereas in Mr. Reissner's opinion they are but a predisposing cause—one of the avenues through which penetrate the irritating agents that produce hyperemia, the migration of the white corpuscles, and the edema of the tissues.

Certain mouth-washes have been said to act as the irritating agent in cases of lip eczema, particularly those which contain salol among other ingredients. He has investigated the subject by experimenting with a number of preparations, and has found that a mixture of alcohol with a few crystals of salol never acts as the irritating agent in eczema, but that the use of a solution in which oil of peppermint is present—in the proportion of twenty-five drops of the oil to about three and one-third ounces of the salol

solution—is followed by abnormal manifestations in the lips, which cannot be differentiated from the characteristic signs of the first stages of eczema. In addition, by further investigation of the subject, he was led to frame the conclusion that all essential oils under similar conditions, will cause similar phenomena about the mucous membranes of the lips and adjacent structures.

The only method of treatment suggested by the author is the one which consists in eliminating the source of irritation, and in the frequent external application of ice. The application of soothing ointments Mr. Reissner considers as unnecessary.

[*La Revue de Stomatologie*, Paris, November 1906.]

INTRADENTAL ANESTHESIA BY MEANS OF EXTRA-DENTAL INJECTIONS OF COCAIN-ADRENALIN. By DR. CROS, BÉZIERES, FRANCE.

The author has devoted considerable time to the study of the question of abolishing as much as possible the pain which in the large majority of cases accompanies the performance of dental operations. The therapeutic problem of rendering painless the curetting of the dentin he has carefully investigated, and in view of the difficulties accompanying the topical application of obtundents, often of but mediocre value in so far as their effects are concerned, has had recourse to a method which has given him most satisfactory results, and which he outlines as follows:

He injects into the tissues overlying the tooth to be operated upon from 3 to 4 cm. of a one per cent. solution of cocain hydrochlorid, to which one, or in some cases two, drops of adrenalin chlorid solution are added. The injection is performed as for the extraction of teeth, with the slight difference in technique that instead of waiting only three or four minutes before operating, Dr. Cros postpones operating until eight or ten minutes have elapsed from the time the injection is made. The results which he has obtained have thus far been so encouraging that at the present time he employs the method extensively in cases of caries of the second degree, pulpitis, etc., and to prevent the pain caused by the cutting of the crown of a live tooth preparatory to crowning. Cervical cavities

of the second degree, invariably so painful to excavate, especially in young patients, may be prepared by the method in question without causing any disagreeable sensation, and if any overhanging gum-margin be found crowded into the cavity, it may be removed without any discomfort whatever.

The author concludes his article with a report of several cases in which the extra-dental injection of the cocain-adrenalin solution had permitted him to perform painlessly operations which otherwise would have been the source of intense discomfort.

[*Le Laboratoire*, Paris, January 6, 1907.]
THE WORK OF JOSEPH AUDIBRAN. By B. PLATSCHICK.

Even before the application of porcelain to dental art had been completely generalized or accepted without discussion by the majority of dentists, spirited polemics had already arisen regarding the priority of its invention. Public opinion became divided, owing to an echoing lawsuit between Duchateau and Dubois de Chemant, each of whom pretended to be the inventor. Duchateau had the support of his implacable followers, while Dubois de Chemant was none the less fortunate in this respect.

The discussion regarding the priority of the invention assumed such large proportions that it led to the publication of works on the subject by Duchateau and Dubois de Chemant respectively, in which each endeavored to establish his rights to the claim of being the inventor of the method of making mineral teeth, and to invalidate those of his adversary. The discussion was also taken up by some of the contemporaneous writers, and especially by J. Audibran, who devotes an entire chapter to the subject in his "Historical and Practical Treatise on the Incorruptible Artificial Teeth: Containing the Methods of Manufacture and Application. Work approved by the Society of Medicine. Paris, 1821." According to Audibran, the sole inventor is the apothecary of Saint-Germain—Duchateau—while Dubois de Chemant is but a vulgar usurper. But in order to record the facts as accurately as possible, it must be said that the invention belongs not even to Duchateau, for it can be traced back to the founder of the dental art, to the inspirer of all dentists, to the genial Fauchard, who it

will be remembered, in Chapter XIX of his treatise, speaks of the "enameling of dentures made of hippopotamus or elephant ivory to replace and imitate the natural structure—for while the natural eyes have been imitated with eyes composed of enamel, we have neglected the application of this art to the making of artificial dentures." Even in the absence of any other allusion by Fauchard, that remark would be ample justification for the claim which gives to him the priority of the invention. However, according to Audibran, Fauchard did not stop there, for while he does not specifically refer to "porcelain teeth," it is evident that he employed in the preparation of his fictitious enamel ingredients such as might be employed in the manufacture of artificial teeth. Consequently it would not be unreasonable to suppose or assume that he was the first to employ porcelain paste in the manufacture of the "body" of artificial teeth.

"It is therefore possible," says Audibran, "to justly reclaim for this dentist the merits of priority, or at least those of having suggested the primitive idea that led to the invention of incorruptible teeth." Audibran gives in addition some valuable information concerning one Guillemeau, who seems to have been the originator of a paste for making artificial teeth "which never became yellow." He published his formula, which is as follows: "Take some pure white wax melted with a small amount of gum, and add to it a powder consisting of white mastic, coral, and mother of pearl." Audibran believes that Guillemeau, through his published formula, inspired the idea of manufacturing artificial teeth of porcelain paste. "It is possible," says Platschick, "to admit the plausibility of the foregoing statements concerning Guillemeau, but the difficulty lies in the fact that none of Guillemeau's contemporaneous authors have ever mentioned him in this or any other connection." Audibran does not seem to have the slightest doubt that Fauchard, having practiced his profession during a period of thirty years after the publication of his treatise, and having been impressed during that time with the disadvantages of using putrescible substances, did not limit himself to the manufacture of enamels. He must have profited by the beautiful experiments of Réaumur, which eventually made

possible the founding of the royal manufactory of porcelain of Sevres. Fauchard's ideas of the advantages of the porcelain paste in the manufacture of complete dentures probably led him to experiment with porcelain. It is likewise possible that the discovery by Fannay, in 1740, of the manner of applying the red color on porcelain, might have suggested to Fauchard the idea of making dentures with artificial gums.

Regarding the relation of Dubois de Chemant and Duchateau to the introduction of mineral teeth, it should be remembered that Duchateau, the apothecary of Saint-Germain-en-Laye, having worn a denture made of hippopotamus ivory, had personally experienced the disadvantages, from a hygienic point of view, of such a denture, and had on that account been led, in 1774, to construct a denture of porcelain. To carry out his plans he sought the assistance of the manufacturing establishment of which a Mr. Guerrard was the proprietor. The work having succeeded beyond all expectations, Duchateau communicated his invention to the Academy of Surgery in 1776. Unfortunately, however, the tests subsequently made were not followed by the same successful results, and gradually the invention was lost sight of. In 1778 a dentist of Paris, by the name of Nicolas Dubois de Chemant, entered into an agreement with Duchateau by virtue of which he was to acquire the secret of the latter's invention. Once in possession of the secret, Dubois de Chemant, as expressed by Audibran, "blew all the trumpets of fame to announce his new teeth of mineral paste," which he for the first time designated under the term "incorruptible." He published a pamphlet in 1789 under the title of "Dissertation on the Advantages of the New Teeth and Dentures without Odor," which is remarkable on account of the emphatic way in which it condemns all the materials employed by his professional contemporaries.

Notwithstanding the shrewd advertising of Dubois de Chemant in favor of the invention, his success was only mediocre, on account of the crudeness of his attempts to imitate natural conditions. Having failed in so far as public favor was concerned, he addressed himself to the Academy of Surgery, where he likewise failed in securing the support he was in vain seeking everywhere, for the re-

port of the commissioners of the Academy, Dubois-Foucou and Sue—father of the celebrated writer Eugene Sue—was unfavorable to him and his professional interests. However, his claims were favored by the Royal Society of Medicine, and by its action he was enabled to secure a patent for a period of fifteen years. It was at this time that Duchateau carried the case before the courts of the land, for among other things Dubois de Chemant had failed to comply with the article of the agreement in which he pledged himself not to divulge the secret of the process of manufacture of artificial teeth invented by Duchateau. A patent being an irrevocable document, and having been so declared by the court before which the case was tried, Duchateau lost his case, and Dubois de Chemant, although unjustly, still remained before the eyes of the public as the inventor of something he had never originated. Shortly afterward Dubois de Chemant secured a patent in England which protected his invention for a period of twelve years.

Dubois-Foucou, on the other hand, seized the porcelain idea; carried on investigations with the view to correct imperfections; worked indefatigably, and eventually succeeded. At first he employed hard porcelain, but being unable to attain in his furnace the temperature at which it fuses, he turned his attention to the soft porcelain of Sèvres. This paste not being sufficiently resistant to withstand the action of the secretions of the mouth, he eventually devised an improved formula, containing clay of Limoges (kaolin), amber earth, Belleville sand, terre de Renard, manganese, cobalt, and petunse. With these different substances he produced artificial teeth of the three principal colors—

bluish black, grayish white, and yellowish white.

Although Audibran speaks of the first usurper, Dubois de Chemant, in a tone of deep indignation, yet of the second usurper, Dubois-Foucou, he speaks in more moderate terms and in a tone of indulgence; for, in his—as it seems to us—authoritative opinion, while Duchateau is the true inventor of dental porcelain, Dubois-Foucou was the first to publish and improve the invention.

But Dubois de Chemant and Dubois-Foucou were by no means the only ones who attempted to appropriate Duchateau's invention. In 1808 Fonzi announced a new improvement in porcelain teeth, consisting in that each tooth was made separately (individual porcelain teeth) and provided with platinum pins. These new teeth he presented at the *Athénée des Arts*, which society awarded him a medal and a wreath.

Audibran does not question the merits of Fonzi's invention, but accuses him—*le Sieur Fonzi, dentiste étranger*—of accepting honors and rewards which should have been awarded to the real inventor and his successors.

In 1812 Dubois-Foucou anonymously created a fund for the striking of a suitable medal to be awarded to the author of the answers to five questions concerning the improvement of artificial teeth. Two memoirs were presented by Maggiolo of Nancy and Cornelio of Turin, and one by Audibran in the form of the treatise referred to in the text of the present review. Maggiolo received an honorable mention, and as nothing can be found regarding Audibran's literary efforts, it would seem that his work was entirely ignored.

PERISCOPE.

Opening Flasks.—The fit of a great many rubber plates has been spoiled by opening the flask too soon after vulcanization. It should be thoroughly cooled before the flask bolts are removed, or warping is nearly certain to take place.—*Western Dental Journal*.

Treatment of Sensitive Cervical Margins.—If sodium bicarbonate is incorporated in the tooth-powder used by the patient, sensitiveness will be relieved, and he will be enabled to thoroughly masticate, thus bringing about a normal condition of the saliva.—D. SPALDING, *Dental Register*.

Pain After Tooth-Extraction.—The extraction of an abscessed tooth is generally followed by great pain. I have found lysol to be the ideal remedy in such conditions, placing it undiluted in the socket. It will relieve the pain immediately, help to check the hemorrhage, and establish antiseptic conditions in the socket.—G. B. WINTER, *Dental Era*.

An Important Physiological Requirement in Pulp-Capping.—In order to encourage the throwing out of secondary dentin as a protective to the pulp, the greatest care must be used to preserve the superficial soft-tissue layer of the pulp, from which the secondary dentin is formed, much in the same way as a surgeon preserves the periosteum intact for future bone-formation.—F. COLEMAN, *Dental Record*.

Attaching Facings to Caps with Porcelain.—Make the cap of platinum soldered with pure gold. The post should be of platinum or iridio-platinum. Let the facing end of the post extend one-quarter of an inch beyond the cap, and take an impression with the cap and post in position on the root. Take a bite if necessary. Set the cap and post in the impression and run a cast of investment compound. Grind a facing to fit the cap and bend the pins upward and out of the way, but closely in contact with the protruding end of the post. Cut off the end of the post, leaving enough to be reached by pins. Invest and attach the post to the pins and cap with a little pure gold. Remove the

investment and add the porcelain body. The first baking should not extend higher than the pins, or the contraction upon cooling might check the facing. This makes a little stronger crown than where the facing is backed and soldered to the cap, is but little more trouble, and costs less.—R. E. SPARKS, *Dental Review*.

Glycerin and Rose-water.—A bottle of glycerin diluted to half strength with rose-water should be kept on hand constantly to apply to the patient's lips before operating, as it overcomes any tendency to soreness. Smear over the holes in the rubber dam it facilitates passage between the teeth, and is much less objectionable than soap or vaselin.—*Dental Review*.

The Necessity for Dental Services in Public Institutions.—There should be a dentist on every hospital staff, on the medical staff of every home for the orphan or the aged, and on the staff of every other public or eleemosynary institution. I will go farther, and state that every institution that requires a physician should also have a dentist.—F. W. WISEMAN, *Dental Era*.

A Gold Corner on a Porcelain Facing.—Grind off the corner and burnish the backing over the spot; remove, invest, and solder on the gold corner. Polish and replace on the porcelain. By this method a diamond drill is not required. The gold corner on the inlay is admissible only in a mouth where other teeth are already contoured with gold.—L. A. STEMLER, *Items of Interest*.

Death Caused by the Swallowing of an Artificial Denture.—The *News and Observer* of Raleigh, N. C., the leading daily paper of that city, reports on January 29th the case of a lady patient in the Watts Hospital of Raleigh, who was convalescing from an operation to which she had submitted three weeks previously, and had recovered rapidly to the point where she was considered to be entirely out of danger. She had been seen by her physician, who had just left her, when he was recalled from another ward by the nurse, and hurried to the patient's bedside to find

that she was manifesting evidences of strangulation.

Suspecting that she might possibly have swallowed her artificial teeth, an examination was made, and the artificial fixture was found to be located in the patient's throat. The plate was removed as quickly as possible, but life was then extinct. The physician said that she had either strangled to death or ruptured a bloodvessel in her effort to remove the plate. The small plate fitted flatly over the windpipe. But a few minutes elapsed between the time when the doctor left her and her death.

Investing Crowns and Bridges.—Indifference and slovenly methods used in investing crowns and bridges produce too frequently unsatisfactorily fitting bridges, and result in broken and checked facings. The habit of pushing a case into a soft, moving mass of investment, which in turn rests on an uneven or soft surface, such as blotting paper, or even common paper, is bad practice. Proper size boxes, from the ordinary sandpaper disk boxes to well-selected ones of larger sizes, should be used. The boxes filled about two-thirds with investment material will firmly hold and securely incase every line and crevice of the invested bridge or crown. Save your sandpaper disk boxes; they are useful when investing a single crown or small bridges.—A. PERCIVAL BURKHART, *Items of Interest*.

Setting Crowns and Bridges with Gutta-percha Cement.—During many years the cementation of crowns and bridges has been with me a subject of close study, and many, many times I have wished I might with ease remove a crown or bridge. One of the causes I may say was, for instance, this complaint: "Doctor, that bridge you set in my mouth bothers me, because one or two of the abutments ache at times, and are sensitive to heat and cold"; or the patient has reported a cap on an abutment loose, while the others remained perfectly firm. To remove a bridge under such conditions—and yet safety and duty suggest it—means tremendous labor, particularly if it include one or more Richmond crowns. The conditions mentioned have confronted nearly every dentist, whether of limited or extensive experience. Many valuable abutments are destroyed because of the difficulty attending the timely removal of bridges set with crystal cements. So far as single crowns on anterior roots are concerned, for years I have employed gutta-percha, and with most excellent results; but for bridges, up to about three years ago, I continued using the ordinary crystal cements. Three years

ago I began using Evans' gutta-percha cement for setting bridges, using it cautiously at first, but now I use it almost exclusively. As a result of my observation and experience, I now find myself in a position to remove a bridge easily and quickly without injury to an abutment. I make it a rule to instruct my patients to return for an examination twice each year, and if dangerous symptoms should be present, I remove the bridge and perform such services as will best benefit the case. Had I used gutta-percha cement earlier in my practice, and observed the rules I now do, I am sure numerous valuable abutments which were lost would now be in a good state of preservation.—A. PERCIVAL BURKHART, *Items of Interest*.

Packing and Finishing of Cement Fillings.—While matrices and a previous separation may be of value in making some fillings which should be given a buckling point of contact, clinical evidence indicates that a cement filling in any occluso-approximal cavity should have a much larger contact surface presented to the adjoining tooth. The cement should be packed firmly directly against the approximal surface of the adjoining tooth, and in finishing, an interdental space created at the cervical third only. By dismissing the case in this condition, floss silk can be carried through to the cervical space and withdrawn laterally after a few hours, and the history will be that food will not be forced against the gum septa for a series of years, provided the cement was mixed to the proper degree of stiffness.—W. V.B. AMES, *Dental Era*.

Prosthetic Hints.—A good pickling outfit can be made by taking a large-size cigar box; fill it two-thirds full of plaster, mixed fairly thin, and while it is still soft set in it three common crockery cups. When the plaster is set, these can be removed and cleaned, and when in their place cannot be tipped over. One is for the acid, the next for sodium bicarbonate solution, and the third for plain water; the cover of the box keeps everything clean.

A stock solution of whiting or yellow ocher in alcohol is handy to coat the surfaces upon which you do not wish the solder to flow. This same solution is useful as a separator for Melotte's metal dies. Vaseline on strips and disks prevents them from catching in the rubber dam, and they will not become hot. If saved, they will eventually bring a few easy dollars from the refiner.—*Pacific Dental Gazette*.

Expansion of Plaster of Paris Casts and its Compensation by the Contraction of Zinc Dies.—The expansion of plaster can be readily perceived by anyone who is called upon to employ this material in the laboratory. I will give you a little of my personal experience. Out of seven plaster impressions taken of five different mouths, dies made of low-fusing metal resulted in five misfits. Of five plaster impressions of the same five mouths—taken as most of us take these plaster impressions—zinc dies made from those plaster casts resulted in five fits; that is to say, the patients could wear the plates constructed upon these dies. We all know that zinc shrinks considerably, and the shrinkage of the zinc just about compensated for the expansion of the plaster.—*Dental Register*.

The Reliability of Amalgam.—During the past ten years, and a little over, I have kept up my work with this material, and during that time I can say that I know of many fillings that have been made by myself and others that have kept as clean margins, just as free from any discoloration of the dentin or enamel, as have any gold fillings, and believe this may be made general. I do not claim that this can be done with the same regularity as can be done with gold; nor that it is as easy to do this in any ordinary method of working with amalgam—the manipulation of amalgam to produce regularly first-class results is more difficult than the manipulation of gold, therefore it is in that degree a less reliable material—but that the operations with amalgam which you perform for your patients can be improved, and vastly improved, I feel confident, without any possibility of doubt.—G. V. BLACK, *Dental Practice*.

A Comparison of the Properties of Novocain and Alypin with those of Cocain.—In the *Répertoire de Pharmacie* of September 10th and October 10th, M. Paul Lemaire has given a useful comparison of the properties of novocain and alypin with those of cocain. These substitutes for cocain are considered to possess similar physiological properties to cocain, and it is claimed for them that they possess the additional advantage of withstanding sterilization at the boiling-point or at 110° C. in an autoclave, without impairment of their anesthetic properties. Aqueous solutions of both novocain and alypin have a neutral reaction, and they are both precipitated by the usual alkaloidal reagents and by ammonia, caustic soda, lead subacetate, and silver nitrate. Alypin, like cocain hydrochlorid and stovain, is precipitated by sodium

carbonate and by borax, but novocain is compatible with these substances and with potassium iodid. Hence it can be prescribed in the form of eye-drops containing novocain gm. 0.1, borax gm. 0.2, and distilled water gm. 10; as a subconjunctival injection containing novocain gm. 0.25, potassium iodid gm. 0.5, and distilled water sufficient to make 10 ccm. If a solution of novocain acquires a yellow color it should be rejected, as it may then cause irritation.—*Dental Record*.

Splints for the Anterior Lower Teeth.—A few years ago a very good-looking young woman, whose lower incisors I had previously treated for pyorrhea, returned to me with the gums very much receded, and two of the teeth so loose that I feared their loss very soon. It was a "condition, and not a theory," and demanded prompt and definite action. The teeth were white, rather long, thin, regular, and much in evidence when talking. To employ bands or other appliances showing gold seemed out of the question. As a temporary brace, the teeth were tied together with silk ligature down close to the gum. Then a model was obtained from a plaster impression, and from this a metal die was made. To the lingual surface of each tooth a piece of pure gold was swaged from the cutting edge to just below the thickest portion of the tooth at its base. Perpendicular holes were drilled in each tooth, one at the base, and one, and sometimes two, at or near the top. The gold backings were then placed on the teeth and punctured to conform to the drilled holes. A good method of holding them to their positions is to tie them with a silk ligature.

A platino-iridium wire of suitable gage and preferably threaded is placed in each hole, and allowed to extend above the backing from one-eighth to one-fourth of an inch. Plaster is then flowed over the pins and backing for the purpose of removing them intact. The portion of the pin extending above the backing should be flattened on one side, or beveled at the end, as a guide in readjusting it, in case it pulls or is displaced in removing. The pins are then soldered to the backing, using but little solder. The backing is then replaced on the tooth and carefully burnished to place. Remove, and invest the backing and reinforce with solder. Now replace them on the teeth, remove in a plaster impression, invest, and solder them together. It is advisable to adjust the rubber dam before cementing the piece in place. I have set several splints constructed in this manner, and as I have seen them from time to time since, they were apparently holding perfectly.—R. I. BLAKEMAN, *Dental Summary*.

[The method of splinting teeth loosened by

pyorrhea, above outlined by Dr. Blakeman, is practically identical to the procedure described by Dr. W. V-B. Ames, and published in the report of the Transactions of the National Dental Association for 1901, and in the DENTAL COSMOS for May 1903, in a paper entitled "Bridge Work in the Cure of Pyorrhea Alveolaris." Dr. Blakeman makes no allusion to the devitalization of the loose teeth to be splinted; while Dr. Ames for reasons sufficiently warrantable, and in accord with the opinion of an array of clinicians and special investigators, advocates and practices the devitalization of the diseased organs in all cases in which the retention calls for radical procedure.—Ed.]

Prescription for Obtunding Sensitive Dentin.—

R—Menthol,	gr. xx;
Chloroformi,	℥ss;
Etheris,	℥3j. F.

Sig.—Use as directed.

This will not completely desensitize all dentin, but in large cavities where there is an extensive area involved, and where the dentin is extremely sensitive, take a little pellet of cotton, saturate it with the above liquid, place it in the cavity after the rubber dam has been adjusted, and you will find by the time you are ready to excavate the dentin that the ether and chloroform have volatilized. The value of this remedy depends largely upon the volatilization of these fluids. As the two liquids are volatilized there is abstracted from the tooth-structures a certain amount of heat, and that volatilization drives the menthol into the decayed dentin. You cannot remove the decay painlessly in all instances, but you will be surprised to find at times how painlessly you can remove it after applying this remedy.—J. P. BUCKLEY, *American Dental Journal*.

Technique of Amalgam Restorations.—

In restorations with amalgam involving more than one wall, a band matrix should be used. It can be made either of thin copper or the Angle band material, which comes in different widths. I prefer them soldered to fit the case in hand; or I have enough made up of different sizes so that one can be selected without undue delay to fit the teeth under treatment. The band should be firm enough to withstand the lateral pressure of heavy condensation. They should fit as closely as possible at the gingiva, and yet allow for contact points. An orange-wood wedge will nicely preserve the interproximal space, and help to hold the band. If I feel that I can not obtain sufficient anchorage in the tooth to withstand the probable strain, I set one or more pins in the canals. If there be any question about the strength

of a wall, I cut it off far enough gingivally to give good thickness to the amalgam over it. I feel that a single standing wall is more or less a menace to the operation, and unless esthetics require its preservation, I never hesitate to cut backward most heroically. If it is a buccal wall, and that or the adjoining teeth show a tendency to buccal decay, I cut backward under the free margin of the gum, reducing the area of liability as far as possible.

A carborundum stone is one of the best instruments for cutting down the walls when the whole occlusal surface is involved, or in many cases where one or more walls are left standing. A chisel is the instrument with which to test a wall if one is in doubt. If a weak wall be left standing for cosmetic reasons, it should be supported with cement.

The base of the cavity should be broad and flat in proportion to the size of the filling. If one has any doubt about these fillings standing, just study for a minute the base, or anchorage, with the stress it has to bear, and compare it to an incisor pin crown. In the case of the molar there is a broad base, short leverage, and stress largely direct. In the incisor the base is narrow, the leverage long, and the lateral stress in most cases is heavy. Yet no one hesitates to put on an incisor pin crown without a band, or to build up large contour gold fillings.

The walls of the cavity should be nearly parallel, with no overhanging margins to interfere with access in placing the filling, or to fracture in the future. The alloy should be packed with broad-faced serrated instruments, using heavy pressure. A foot plunger in an automatic mallet packs the amalgam well, and is especially good along margins, and for contouring the matrix.

A great deal of care should be used in carving the cusps, reproducing the anatomical features of the particular tooth, and to secure a good articulation. In cases where the cusps of the occluding teeth are worn flat, I think it is advisable to produce more definite cusps than the articulation actually demands. The carving is best done when the filling is partly set. The fissures and fine lines can be worked out with excavators of different patterns, or broken instruments ground to the desired shape. After the filling is finished as much as it can be with the matrix on, the latter should be left on for twenty-four hours. Then remove the band and carefully polish the filling with disks and strips.

In summarizing, I would say that these amalgam restorations are strong, permanent, hygienic, and serviceable operations. They fill a place in practice that cannot be filled by crown or inlay, because of either hygienic or economic reasons.—GEO. R. WARNER, *Items of Interest*.

HINTS, QUERIES, AND COMMENTS.

REPAIRING PORCELAIN FACINGS.

WHERE porcelain facings check or break in bridge or crown work, it is a difficult matter to remove the bridge or crown for repairing it, especially where Richmond crowns are used for anchorage.

By the following method porcelain facings can be replaced very satisfactorily without removing the bridge, or without giving any discomfort to the patient:

Select a facing of proper size and shade to replace the broken one, and drill holes through the gold backing for the pins of the facing; countersink the holes on both sides of the backing, prepare the facing to fit the backing properly, then cut the pins so that

they are just a little longer than the thickness of the backing; split the pins of the new facing with a thin ribbon saw, half the distance of the thickness of the backing.

The facing is now ready to be fastened in place by using a little medium-setting alloy in the pinholes that come next to the porcelain; then press the facing firmly in place, holding it until the operation is completed. With a little hatchet-shaped instrument spread the split pins firmly, as in riveting, and then burnish the alloy in the pinholes. After the alloy has sufficiently hardened, grind the lingual surface down to the original form, and a very slightly and durable piece of work will be the result.

GUSTAVUS NORTH, A.M., D.D.S.

Cedar Rapids, Iowa.

OBITUARY.

SIR MICHAEL FOSTER.

WE regret to record the death of SIR MICHAEL FOSTER of Ninewells, Great Shelford, Eng., one of the most brilliant lights of the scientific world, who died in London, January 29, 1907. Sir Michael had been in failing health for some time past, and while on a visit to London became suddenly worse, dying of heart failure following hemorrhage.

Sir Michael Foster, K.C.B., M.D., F.R.S., D.C.L., D.Sc., LL.D., formerly M.P. for London University, was born March 8, 1836, at Huntingdon, and was therefore seventy-one years of age. He was the son of Mr. Michael Foster, F.R.C.S., a practicing surgeon of Huntingdon, whose family had gained great wealth and social position, and who are well known in the eastern counties.

Sir Michael gained his early education at the Huntingdon Grammar School until the age of thirteen years, when he went to London to

study at University College School in Gower street, where he remained until sixteen years of age, when he matriculated at London University and entered University College. Before taking this step he was recommended to compete for a scholarship at Cambridge, his tutor being confident that even youthful as he was he was sure to succeed. His father, however, being a nonconformist to the Church of England, opposed his son's going to a university where a religious test would prevent his taking a degree. He therefore remained in Gower street, and added one more brilliant name to its distinguished roll of students.

Up to this time he had displayed no special scientific aptitude, but showed marked ability in every study in which he engaged, taking all the principal prizes, and finally in his third year securing all the honors. In the "honors" examination for the B.A. degree he carried off the classical scholarship; and

having received his degree in 1854, when only eighteen years of age, he decided to follow his father's profession, and consequently passed over to the medical side of the college. Here he took the prize for physiology, and thenceforth devoted himself to original work.

At the age of twenty-three he had taken his M.D. degree, and this done he retired to Huntingdon and shared his father's practice.

In 1867 the young Huntingdon surgeon went to London and obtained employment as teacher of practical physiology at University College, where two years later he was appointed professor. In consequence of symptoms of pulmonary disease showing themselves, he spent some months of 1869 on board the cruiser *Union*, employed in the service of the Khedive in the Red Sea.

Later on, in 1870, he was recommended by Professor Huxley and Dr. W. B. Carpenter for the position of prelector of physiology at Trinity College, Cambridge, to which he was elected. The authorities there offered him a Fellowship, but possessing the same religious scruples as actuated his father, and again refusing to conform, he declined the honor.

In 1872 Sir Michael was elected a Fellow of the Royal Society, and in 1881 succeeded Huxley—who had become president—as one of its secretaries, which position he retained until 1903. In 1883, when Cambridge had founded a chair of physiology, Sir Michael was appointed professor, being the first non-conformist professor appointed after the university religious tests were abolished. This post he held for twenty years, and it was here that his greatest work was accomplished. During this period he had the satisfaction of witnessing the establishment of the National Physical Laboratory at Bushey.

In 1899 Sir Michael Foster was president of the British Association, and in the same year he received his knighthood. From 1900 to 1906 he sat as member of Parliament for London University.

Sir Michael was the author of a number of physiological works, the foremost being his "Text-book of Physiology," which has gone through many editions, and been translated into German, Italian, and Russian. He was joint editor of Huxley's "Scientific Memoirs."

Oxford conferred upon him the honorary degree of D.C.L., and Dublin the honorary degree of D.Sc.

The breadth and liberality of his mind was well exemplified upon the occasion of the second annual meeting of the International Dental Federation in Cambridge, Eng., in 1901, when as deputy vice-chancellor of the university of Cambridge he delivered his memorable address of welcome on behalf of the university authorities to the delegates of the dental profession from seventeen different nations. His utterances on that occasion we have frequently referred to in these pages, and whatever exception may be taken to the views which he then expressed, there can be no difference of opinion as to their broad catholicity, their utter freedom from professional prejudice, and their intense portrayal of the loyalty of the speaker to the ideals of scientific truth and justice. Not only that, but the personal attributes of his character demonstrated in many ways the greatness of his mind and heart, and in that noteworthy international gathering he conveyed the impression that though a loyal patriot, a lover of his country, he was endowed with that still greater life-inspiration the love of mankind. His words, his personality, his aggressive internationalism, will ever remain as inspirations to all who were so happy as to have attended the Cambridge meeting of the F. D. I.

On the occasion of the entertainment of the Dutch dentists by the Eastern Counties Branch of the British Dental Association, at Cambridge, Sir Michael made one of his characteristic speeches, in which he coined the phrase "*l'entente internationale*," his conviction being that one of the great aims and probable achievements of science should consist in bringing the nations of the world together.

He was one of the first members of the university to take up the study of Esperanto, of which he was an enthusiastic supporter, and honorary president of the local group.

Sir Michael was twice married, first in 1863 to Georgina Gregory, who died in 1869, and second, to Margaret Sarah Rush, in 1872. He leaves a son and daughter.

SOCIETY NOTES AND ANNOUNCEMENTS.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

The Jamestown Dental Convention, to be held under the auspices of the Jamestown Exposition Company, the Southern Branch of the N. D. A., and the Virginia State Dental Association, will convene at Norfolk, Va., September 10 to 12, 1907. The Jamestown Exposition Company have appointed the above named gentlemen as a Committee on Organization, to elect officers in advance of the meeting, to appoint all committees, to finance the meeting, and to bring it to a successful termination.

The Committee on Organization have appointed Dr. Clarence J. Grievess, Baltimore, Md., general chairman of the Clinic Committee and Supervisor of Clinics.

A number of well-known men will assist him on the General Committee. State clinic chairmen have been selected from every state in the Union. The clinics are to be the principal feature of the convention, and it is expected to bring about the largest and most instructive dental clinics ever held. A surgical clinic will also be held under the supervision of Dr. L. M. Cowardin, Richmond, Va.

The other members of this committee are J. Y. Crawford, Nashville, Tenn., and A. G. Friedrichs, New Orleans, La. Dr. F. W. Stiff, Richmond, Va., is general chairman of the Membership Committee.

Assistant state chairmen have been appointed from every state in the Union. Already membership fees are being sent in, and the promise is for the largest gathering of dentists ever held. Only five essays will be read at the convention, one by Prof. W. D. Miller, another by Prof. G. V. Black, and the other three by well-known southern dentists.

Several exhibits of much interest to the profession will be held under the auspices of the convention; among them the dental manufacture exhibit in charge of Dr. John W. Manning, chairman, Norfolk, Va.; a comparative anatomy exhibit, in charge of Dr. W. M. Bebb, chairman, Los Angeles, Cal., which exhibit will consist of three thousand comparative anatomy specimens, and also numerous other collections of interest; a dental historical exhibit, consisting of ancient instruments, operative and prosthetic work, books and photographs, under the chairmanship of Dr. Wm. H. Trueman, Philadelphia, Pa.; the orthodontia exhibit, showing a large collection of models, etc., under the chairmanship of Dr. H. E. Kelsey, Baltimore, Md. The U. S. Naval dental exhibit, showing 3000 charts of the mouths of midshipmen, will be under the chairmanship of Dr. Richard Grady, the U. S. dental surgeon of Annapolis, Md. The exhibit of the U. S. Army Dental Corps, under the chairmanship of Dr. John S. Marshall, San Francisco, Cal., will also show the equipment, method of keeping records, etc., used by the dental corps.

A full list of the various officers, who are to be elected in advance by the Committee on Organization at their next meeting in February 1907, and of the committees, will appear in due time in the various dental journals. The Committee of Organization is expected to

select officers in advance in order that the officers may be prepared for their duties before the actual meeting of the convention.

A cordial invitation is extended to all reputable members of the profession to become members of this convention, and to assist the Committee on Organization in bringing about one of the best, if not the best, dental meeting ever held.

The Exposition itself offers an excellent opportunity for the busy practitioner to take a delightful vacation, see the wonderful historical and naval and military exhibits at the Exposition, and also to participate in this meeting. The membership fee, which is \$5.00, should be sent to Dr. F. W. Stiff, treasurer, 600 East Grace st., Richmond, Va.

For further information address

H. W. CAMPBELL, *Sec'y*,
Suffolk, Va.

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompert, general secretary; Dr. Gires, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Subscriptions and communications should be addressed to

DR. CHOMPERT, *General Sec'y*,
182 rue de Rivoli, Paris.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

NOTICE TO THE ALUMNI.

ANY alumnus not having received a copy of the souvenir number of the *Pennsylvania Dental Times*, giving the proceedings of the golden anniversary of the Pennsylvania College of Dental Surgery, may secure the same by sending his name and address to

WILBUR F. LITCH, *Dean*,
Eleventh & Clinton sts., Philadelphia, Pa.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE American Dental Society of Europe will hold its next annual meeting in Rome, Italy, on March 29 and 30 and April 1, 1907. A very cordial invitation is extended to members of the profession to be present.

As it is the first meeting of the society in the Eternal City, it is hoped it may be the most enjoyable one in its history.

J. W. GALE, *Hon. Sec'y*,
79 Hohenzollern-Ring, Cologne (Rhine), Ger.

AMERICAN SOCIETY OF ORTHODONTISTS.

At a meeting of the American Society of Orthodontists, held in New York city, December 29, 1906, the following resolutions were adopted:

RESOLVED, That in the opinion of the members of the American Society of Orthodontists the practice of paying a commission, honorarium, or any sort of fee, in consideration of the reference of a patient, is both unwarrantable and unprofessional; and be it

RESOLVED, That the payment of any such commission, honorarium, or fee, by any member of this society, shall be sufficient cause for the expulsion of said member, by vote of the society after conviction; and further be it

RESOLVED, That in case of co-operation in the care of a patient between a general practitioner and an orthodontist, there shall be no division of fees, but each man shall render a separate bill for his personal services.

FREDERICK S. MCKAY, *Sec'y*.

FIRST AUSTRALIAN DENTAL CONGRESS.

THE announcement reached the *Cosmos* too late for insertion previously, of the holding of the First Australian Dental Congress, in Sydney, N. S. W., at the Medical School of the University of Sydney and the United Dental Hospital, February 4 to 9, inclusive, 1907.

Dr. Alfred Burne was chosen president, Ernest Deck treasurer, and W. H. Weston honorary secretary-general.

Contributions of interest were solicited from members of the profession abroad, and it is stated that the proceedings will be published in book form.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY.

THE Odontotechnique Society of New Jersey will hold its next regular meeting on Saturday, March 2, 1907, at Ahtel-Stetter's, Newark. The paper of the evening will be read by Dr. Corwin of Newark—subject "Adenoids."

Plans are now on foot for a clinic to be held on the afternoon of the date of the April meeting, Wednesday, April 3, 1907, to be followed by a banquet in the evening, at which a paper will be read by Dr. Ellison Hillyer of Brooklyn, on "The Progress—Past and Present—of Prosthetic Dentistry." This will be an important meeting, and one of profit to the profession, and a large attendance is expected.

HENRY J. GIBBINS,
Newark, N. J.

SEVENTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Seventh District Dental Society will be held in Colonial Hall, Rochester, N. Y., March 26 and 27, 1907.

We expect to have the largest and best meeting in the history of the society, having secured assistance from some of the most prominent men in the profession. From the present outlook we are going to have a very large exhibit. Arrangements are being made for reduced rates on the railroad.

C. W. LA SALLE, *Sec'y*,
Rochester, N. Y.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the

European plan. Any room in the hotel is capable of accommodating two people. All the rooms have telephone connection, and hot and cold water. Railroad rates will be given later.

The Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,
29 Fulton st., Newark, N. J.

MONTANA STATE DENTAL SOCIETY.

A MEETING of the Montana State Dental Society will be held in Helena, April 12 and 13, 1907.

W. E. TREBSE, *Sec'y*,
Helena, Mont.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-third annual convention of the Connecticut State Dental Association will be held at New London, Conn., April 16 and 17, 1907.

An excellent program is assured.

EDWARD S. ROSENBLUTH, *Sec'y*,
1051 Main st., Bridgeport, Conn.

GEORGIA STATE DENTAL SOCIETY.

THE next annual meeting of the Georgia State Dental Society will be held in Atlanta, May 7, 8, 9, and 10, 1907. All ethical practitioners are cordially invited to attend.

D. H. MCNEILL, *Cor. Sec'y*,
Athens, Ga.

OREGON STATE DENTAL ASSOCIATION.

At the last meeting of the Executive Committee of the Oregon State Dental Association, it was decided to hold the annual meeting in Portland, Ore., May 9, 10, and 11, 1907.

JEAN CLINE, *Sec'y-Treasurer*,
Portland, Ore.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Dental Society of the State of New York will be held in Albany, May 10 and 11, 1907.

Essays will be presented by the following members of the profession: W. D. Miller, Berlin; A. H. Peck, Chicago; Charles McManus, Hartford; Clarence J. Grieves, Baltimore; G. V. I. Brown, Milwaukee; L. C. F. Hugo, Washington; Nelson T. Shields, New York; I. C. Curtis, Fulton; S. L. Goldsmith, New York (Report of Correspondent); E. Howard Babcock, Brooklyn (Report of Committee on Practice); Emanuel Muntz, Buffalo (Report of Committee on Scientific Research).

A full list of clinics is being arranged, and a complete program will be announced later.

CHAS. S. BUTLER, *Sec'y*,
Buffalo, N. Y.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE tenth annual session of the Southern California Dental Association will be held in Los Angeles, May 6, 7, and 8, 1907, at the same time that the Imperial Council of Mystic Shrine meets here, and all members of the dental profession contemplating visiting southern California at that time will confer a favor upon the association by notifying

CHAS. M. BENBROOK, *Sec'y*,
455 S. Broadway, Los Angeles, Cal.

VERMONT STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., May 15, 16, and 17, 1907.

The society has in the past held most successful meetings, and we have every reason to expect that this will surpass any previous one, as a very interesting program has been prepared by the committee, and will be mailed in due time. Vermont has the largest per cent. of membership in its state society of any state in New England, and we hope to see every dentist in the state who is eligible a member.

THOMAS MOUND, *Sec'y*,
Rutland, Vt.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association will hold its annual meeting at Eureka Springs, Ark., May 29, 30, and 31, 1907.

HENRY P. HOPKINS, *Sec'y-Treas.*,
Argenta, Ark.

KENTUCKY STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21, and 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession.

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

LAKE ERIE DENTAL ASSOCIATION.

THE forty-fourth annual meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., on May 21, 22, and 23, 1907.

Upon our program this year are men of exceptional merit, and we are pleased to invite all reputable dentists and their friends to this beautiful place for convention purposes.

V. H. MCALPIN, *Sec'y*,
Warren, Pa.

WASHINGTON UNIVERSITY DENTAL DEPARTMENT.

MEETING OF ALUMNI.

A MEETING of the Alumni Association of Washington University Dental Department (Missouri Dental College) will be held May 20, and 21, 1907, at the college building, 2645 Locust st., St. Louis, Mo.

A number of prominent essayists and clinicians have been secured, and an interesting and instructive program will be presented. Adequate space has been secured for the various manufacturers' exhibits; this will be a noteworthy feature of the meeting. All ethical practitioners are invited.

A. J. PROSSER, *Chairman*,
F. W. HORSTMANN,
CHAS. HERBERT.

SOUTH DAKOTA DENTAL SOCIETY.

THE twenty-fifth annual meeting of the South Dakota Dental Society will be held at Sioux Falls, June 5, 6, and 7, 1907.

A most interesting program has been arranged, and we want to see the largest attendance the society has ever had. A larger membership is desired, and every eligible dentist in the state should become a member. A special invitation is extended to South-eastern Minnesota and Northwestern Iowa dentists to attend.

FERDINAND BROWN, *Sec'y*,
Sioux Falls.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, and 13, 1907. The Executive Committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, *Sec'y*,
Indianapolis, Ind.

TENNESSEE STATE DENTAL ASSOCIATION.

THE annual meeting of the Tennessee State Dental Association will be held at Knoxville, Tenn., July 9 and 10, 1907. A splendid program is being arranged by the Executive Committee, and a most cordial welcome is extended to all.

R. J. MCGAVOCK, *Sec'y*,
Columbia, Tenn.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing 10 A.M. July 17th and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, at the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st.

Prominent dentists have signified their in-

tention of reading papers, and the clinics will all be of a new and novel nature. Clinic committee in charge of Charles H. Dilts, Trenton, N. J.; exhibit committee in charge of Walter Woolsey, Elizabeth, N. J. Programs will be out June 15th.

Last year over eight hundred dentists registered in attendance. The Auditorium where the meeting is held is the largest and best adapted building on the Jersey coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry will be held in Boston, March 6, 7, and 8, 1907, for the examination of candidates. Application blanks and further information may be obtained from

G. E. MITCHELL, *Sec'y*,
Haverhill, Mass.

RHODE ISLAND BOARD OF REGISTRATION.

A MEETING of the Rhode Island Board of Registration in Dentistry, for the examination of candidates, will be held at the Statehouse, Providence, R. I., Tuesday, Wednesday, and Thursday, March 19, 20, and 21, 1907. Application blanks may be obtained of

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold its next regular meeting at Minneapolis, in the Medical Building of the State University, on April 2, 3, and 4, 1907. All applications must be in the secretary's hands by 11 o'clock of April 2nd. Candidates will be furnished all necessary blanks and such other information as is necessary, upon application to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

ARIZONA BOARD OF EXAMINERS.

THE Board of Dental Examiners of Arizona will meet at Phoenix, April 8, 9, and 10, 1907, for the purpose of holding examinations. The fee, twenty-five dollars (\$25.00), should be in the hands of the secretary twenty days before date of meeting. For further information, address

W. P. SIMS, *Sec'y*,
Box 58, Bisbee, Ariz.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, Ark., May 27 and 28, 1907.

A. T. McMILLIN, *Sec'y*,
Little Rock, Ark.

NEBRASKA BOARD OF EXAMINERS.

THE next meeting of the Nebraska Board of Dental Examiners will be held at the State-house, in Lincoln, Nebr., May 29, 30,

and 31, 1907. All applicants for examination must have their applications in the hands of the secretary five days before this date. For further information address.

C. F. LADD, *Sec'y*.
1241 O. st., Lincoln, Nebr.

TEXAS BOARD OF DENTAL EXAMINERS.

THE Texas State Board of Dental Examiners will hold their next regular meeting at San Antonio, Texas, June 10, 1907, at 10 A.M. For further information address

C. C. WEAVER, *Sec'y*.
Hillsboro, Texas.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE next examination of the Board of Dental Examiners of California will be held in Los Angeles beginning June 10, and in San Francisco beginning June 17, 1907.

C. A. HERRICK, *Sec'y*,
Jackson, Cal.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1907.

January 8.

- No. 840,738, to FRANK P. BARNARD. Denti-frice.
No. 840,921, to JOSEPH W. DICKEY. Dental swage.

January 15.

- No. 38,408, to HARRY C. GOWAN. Design for dental cabinet.

January 22.

- No. 841,946, to FRED DOWNING. Tooth-brush.
No. 841,962, to JAMES F. HARDY. Dental flask press.
No. 842,112, to SAFFORD G. PERRY. Dental plugger.

January 29.

- No. 842,357, to HAMILTON F. STRONG. Method of filling teeth.

THE DENTAL COSMOS.

VOL. XLIX.

APRIL 1907.

No. 4.

ORIGINAL COMMUNICATIONS.

ORTHODONTIA AS A PROPHYLACTIC MEASURE.

By **FREDERICK C. KEMPLE, D.D.S., New York, N. Y.**

(Read before the New York Odontological Society at its regular monthly meeting,
November 20, 1906.)

I WISH to thank your committee for the honor conferred upon me by their invitation to present a paper to this society. In accepting their invitation I hoped that I might be able to present a few facts setting forth the importance of occlusion and use of the teeth as a factor in the development of the entire internal face, as well as in maintaining a normal healthy condition of the tissues of the mouth and the upper respiratory tract.

Normal dental arches can no longer be considered from the esthetic standpoint alone, nor can orthodontia be regarded as purely cosmetic. The day is fast approaching when a close relationship between orthodontia and general prophylaxis must be recognized.

Anything that *guards* or defends against disease is a "prophylactic." Any

measure that tends to increase physiological resistance to the invasion of and propagation of pathogenic germs, and thus lessens the liability of the individual to disease, is a "prophylactic measure." If it can be demonstrated that orthodontia as practiced today tends to the physical improvement of the patient by increasing his power of resistance to disease, then orthodontia must have a place as a prophylactic measure.

Throughout this paper I shall make free use of the opinions of men in both the medical and dental professions who have given much study to pathological conditions of the oral and nasal cavities.

From almost every part of the field of medicine we hear of the baneful effects of *mouth-breathing*.

Dr. Coakley, in his "Diseases of the

Nose and Throat," says, "Of the functions of the nose, that which is vitally the most important to the individual is the respiratory."

Dr. Holt, in his "Diseases of Infancy and Childhood," says, "In consequence of difficult breathing children sleep in all sorts of positions, lying upon the face, sometimes upon the hands and knees, and often toss restlessly about in the vain endeavor to find some position in which respiration is easy."

It has been commonly observed in those cases where "nasal breathing has been obstructed from infancy, that there are often found those deep lateral depressions of the lower part of the chest with prominence of the sternum known as 'pigeon-breast,' due to interference with pulmonary expansion." (Holt.) In a large proportion of these cases long-continued mouth-breathing results in impaired hearing due to implication of the Eustachian tube; persistent coughs; hoarseness; bronchial asthma; headaches; impaired general health from lack of oxygen and loss of sleep. The growth may be stunted, the facial expression dull and stupid. These children are languid, listless, and often depressed, and in school are frequently regarded as mentally deficient. These symptoms are not all present in each individual case, but vary in number and severity with each patient.

Mouth-breathers are always in more danger from infectious diseases than normal nasal breathers, because of the lessened physiological resistance of the post-nasal, pharyngeal, and laryngeal tissues, coupled with the fact that the atmosphere is carried directly to these weakened parts without having been filtered and moistened as in nasal breathing.

Some bacteriologists claim that the secretions of the nasal mucous membrane possess bactericidal properties, retarding the growth of some bacteria and preventing the development of others. It is a well-known fact that there are very few bacteria found well within the nasal cavities, which condition would make the claim appear highly probable.

Where the nasal respiratory function has been interfered with for an extended

time, the bony framework of the nose becomes contracted through atmospheric pressure and disuse. If this condition be allowed to continue till the bones of the face have firmly united, "the capacity for nasal breathing is permanently fixed," so far as surgical aid from the rhinologist is concerned.

Dr. Kyle, in his "Diseases of the Nose and Throat," referring to adenoids says, "Even should the gland structure causing the obstruction be removed, while its ablation may relieve the naso-pharyngeal symptoms, it cannot possibly increase nasal respiration, other than by lessening the engorgement of the submucosa. This fixity of the bones of the face may leave the individual a confirmed mouth-breather."

Whether it be due to inflammatory organization in consequence of interference with function, or to other cause, it is a fact that adenoids are very liable to recur in young children, no matter how thoroughly the operation for their removal may have been performed. I have in mind at the present time two children, both of whom I met within the month, a little girl aged eleven years and her brother aged nine. These children were operated upon almost two years ago for the removal of post-nasal obstruction, when they were aged respectively nine and seven years, yet they continue to breathe through the mouth.

Dr. Kyle states that in these developmental deformities due to nasal obstruction, little can be done by the rhinologist toward increasing the nasal space for breathing after the age of seven years.

If these cases—where the bones have become so fixed that even after the removal of the causative obstruction nature cannot restore normal conditions—were placed in the hands of the orthodontist, and he worked in conjunction with the rhinologist, instead of leaving the individual a confirmed mouth-breather the post-nasal space would in many cases be increased, and normal nasal breathing restored without a conscious effort on the part of the patient. (Fig. 1, A, B.) Of course this refers to patients under fourteen or

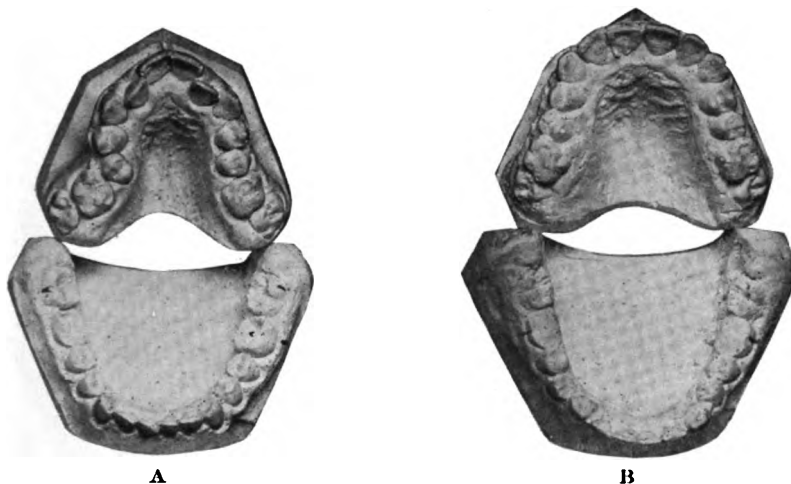
fifteen years of age, the development of the internal nose being almost complete at that time.

In thus playing an important part in the restoration of normal nasal function and normal lip function—thereby lessening the liability of the individual to all those infectious diseases to which the

as I am able to see, is the keynote of all that Dr. Smith has taught on the subject.

The part which the patient takes in this prophylactic treatment becomes an important factor in making a prognosis. Any condition of the mouth which tends to make the thorough cleansing of the teeth by the patient himself a difficult

FIG. 1.



Age thirteen years. A: Diameter of vault in molar region, 1.60 in.; at second bicuspid, 1.33 in.; at first bicuspid, 1.38 in.; at canine, 1.25 in. B: Diameter in molar region, 2.05 in. (expansion 0.45 in.); at second bicuspid, 1.87 in. (expansion 0.54 in.); at first bicuspid, 1.68 in. (expansion 0.30 in.); at canine, 1.54 in. (expansion 0.29 in.).

mouth-breather is peculiarly exposed—orthodontia certainly establishes a claim as a prophylactic.

As dentists, however, we have principally to consider malocclusion and its relation to "oral prophylaxis"—a term which I understand to imply perfect cleanliness of the oral cavity, a condition that can be maintained only through the constant and united efforts of both patient and operator.

Dr. Miller, who perhaps has given more scientific study to the etiology of dental caries than has any other member of the profession, in speaking of its prevention says, "Under all conditions the chief thing is the thorough mechanical cleansing of the teeth." And this, so far

operation, lessens, inversely with the difficulty, the probability of a favorable result. When the dental arch is constricted and the teeth are crowded and overlapping (Fig. 2, A), forming triangular spaces into which food debris is forced by stress of mastication, it is impossible for the patient to keep those teeth clean. Bacteria which possess high fermentative and acid-forming activity lodge in those spaces undisturbed, and the rapidity with which they carry on their destructive work, either in producing caries or pyorrhea, depends entirely upon the degree of resistance offered by the surrounding tissues.

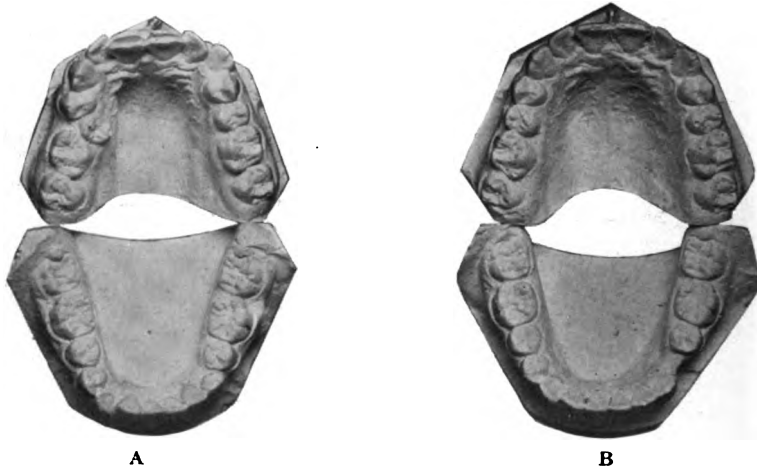
Since first the study of the etiology of dental caries was taken up by the dental

profession, "irregularities of the teeth" has been given and universally accepted as one of the potent predisposing causes of dental decay.

If perfect cleanliness of the teeth will prevent dental caries—and of this there seems to be small doubt—then that condition of regular alignment of the dental arches, normal occlusion, and normal articulation (Fig. 2, B) which best facili-

tifical. In some the crowns of the teeth are so well formed and arranged and knuckle up together so perfectly that as long as the interdental papillæ are in a healthy condition there is little possibility for food to lodge. In others we find the food sticking between the teeth everywhere. There can be no doubt that this circumstance is of very considerable consequence in regard to the origin and

FIG. 2.



Age fourteen years.

tates perfect cleanliness is a condition which must necessarily contribute much to prophylactic treatment of the oral cavity. In the normal dental arch, "Nature has given us an apparatus that is in a large measure self-cleansing," while in those mouths where malocclusion exists, every protected surface of a tooth invites an accumulation the presence of which favors dental decay and gingival irritation.

In a paper entitled "A Study of Certain Questions Relating to the Pathology of the Teeth" (Cosmos 1904, vol. xlv, p. 991), Dr. Miller refers to the facility with which different dentures are cleansed, in the following words: "Different dentures show very marked differences in regard to the efficiency of cleansing processes, whether spontaneous or ar-

progress of caries." "All the cases of immunity to caries which I have examined during the last few months have related to dentures where there was little tendency to retention of food particles." "The comparative immunity of the lower front teeth to caries is due in a great measure to the fact that the food particles do not readily lodge about them." If for any reason food particles are retained, "then these teeth decay as readily as any others."

In almost every case of malocclusion where the lower front teeth are crowded and overlapping, you will find some of them attacked by caries—some so far decayed, because of their broad surfaces of contact, as to be almost beyond the hope of permanent retention. (Fig. 3, A, B.) This is true even in those mouths where

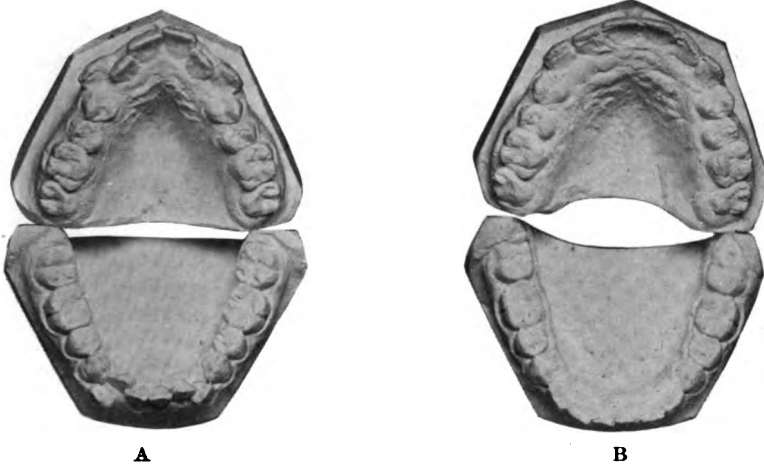
the other teeth are comparatively free from decay.

Concerning the etiology of pyorrhea, there have been theories countless almost as the sparkling orbs of heaven. It has been the subject for heated debate since first the attention of the profession was directed to it by Dr. Riggs, and it may continue to furnish food for controversy till science shall have eliminated

there must still be some predisposition on the part of the membrane which makes it specially liable to such deposition. This predisposition is to be found in impaired nutrition and lowered vitality in consequence of mechanical strain from overcrowding of the dental arch."

Professor Armand Deprès attributes "considerable importance to the overcrowded condition of the dental arch as a

FIG. 3.



Age thirteen years. Lower lateral incisors badly decayed.

it from the catalog of human afflictions. There are those in the profession who maintain that this disease is entirely constitutional; others who claim it to be of purely local origin, and yet others who believe it results from both constitutional and local causes. Investigations have been carried on along these various lines, positive conclusions have been deducted, and these conclusions just as positively controverted. Fortunately we have not to weigh these numerous evidences, but have only to see, if possible, what relation malocclusion may bear to pyorrhea.

Dr. Pierce, in referring to the exciting causes of the disease says, "But even admitting the deposition in the pericemental membrane of waste products of nitrogenous metabolism in combination with calcium salts derived from the blood,

predisposing cause in the development of pyorrhea." Dr. Bödecker believes pyorrhea to be of both constitutional and local origin, and in specifying a list of local causes mentions first of all the "faulty articulation of the teeth." Drs. Black, Marshall, Burchard, Kirk, and many others, recognize malocclusion as one of the contributory causes of pyorrhea. (Fig. 4, A, B.)

A short time ago I had the pleasure of seeing a number of slides shown by Dr. Schamberg. These slides were skiagraphs showing molars which had come into malocclusion or tipped out of the normal through the loss of an adjoining tooth. On the under or protected surface of every one of these teeth was a pyorrhea pocket or area of necrosis.

Chance has long since ceased to have

a place among men of science. Any present condition is but the result of the natural sequence of cause and effect. The co-existence of a crowded dental arch and dental caries, or the co-existence of mal-occlusion and pyorrhea, is not merely a coincidence, but in many cases a consequence—the one owing its existence to the other.

Dr. Campbell reports a case among the poor of London, of a man in his fiftieth year whose teeth were all perfectly sound, a very unusual condition among this class of people. In seeking an explanation Dr. Campbell elicited the fact that "this man was unable to swallow his food without chewing it very thoroughly, and upon giving him a piece of bread with the re-

FIG. 4.



A
Age twelve years. Lower laterals, canines, and first bicuspid predisposed to pyorrhea. B: Predisposition to pyorrhea overcome by correction of the occlusion.

It is very probable that the various organs of the body were prepared for their special physiological functions through a process of variation and natural selection due to environment, and to the necessity for using or not using certain parts of their anatomy. Naturalists are observing anatomical changes going on today. The ostrich, through his desire to walk, has lost his power to fly.

The effects of the disuse of the teeth for masticatory purposes are readily seen in those mouths where, from sensitiveness of a tooth or any cause, the patient uses only one side of the mouth. The accumulation of food debris in the disused portion, the calcic depositions about the necks of these teeth, and the concomitant inflammation of the gum tissue in this region, all tell the story of what mastication does for the teeth and mouth.

quest that he chew it in the ordinary way, found that he subjected it to one hundred and twenty bites before swallowing it. The temporals and masseters were enormous, and the nasal passages well developed, while the oral mucous membrane was unusually healthy."

The dental hygiene being taught today is only an attempt to restore by artificial means the health of those tissues of the oral cavity that are suffering from disuse. It is false doctrine to teach, as one gentleman endeavored to in his discussion of a paper at the meeting in Washington of the Southern Branch of the National Dental Association, that "Our teeth are not for mastication in our present civilization;" that "mastication and insalivation are not necessary processes at all."

Professor Irving Fisher of Yale University recently conducted some experi-

ments to discover whether attention to slow eating and enjoyment of the food would affect the working powers of the individual. The experiments were made with nine Yale students, and lasted four and one-half months. The rules of the experiment were, first, thorough mastication of the food, with the attention directed to its taste and enjoyment; and second, implicit obedience to the appetite. The men ate nothing which they did not choose of their own free will. Nothing was set before them except as ordered by them, and meats were available three times a day. They led sedentary lives, and took no more exercise than they had been accustomed to before the experiment began.

At the end of the first half of the time the men had improved fifty per cent. in endurance. At the end of the second half they were able to do double the amount of physical work—as shown by gymnasium tests—that they were capable of doing at the beginning of the experiment. It was also found at the close that

their consumption of flesh foods had decreased to one-sixth of the original amount.

The trituration and insalivation of the food are not the only important functions of mastication. In normal occlusion of the teeth the evenly distributed force of impact during the process of mastication affords a stimulus not only to the teeth, but to the membranes of the mouth, the peridental and alveolar tissues, and even to the maxillæ and mandible, which is beyond our power to measure.

Orthodontia is not a panacea, but normal occlusion of the teeth is a very important factor in producing the normal development of the internal face, as well as maintaining a normal hygienic condition of the mouth by the natural processes of mastication.

When an organ is no longer called upon to perform the function for which nature intended it, just so soon does it begin to lose its power of function and to atrophy, and is very likely to become the seat of disease.

ORTHODONTIA: OPENING THE BITE IN THE REGULATION OF THE TEETH: A METAL FLANGE FOR IMPROVING THE ANCHORAGE OF APPLIANCES, MOVING TEETH, AND FOR HARMONIZING THE OCCLUSION.

By V. H. JACKSON, M.D., D.D.S., New York City.

(Read before Section I of the National Dental Association, Atlanta, Ga., September 18, 1906.)

IN the practice of orthodontia, cases are presented with irregularities of the teeth in which the abnormal occlusion requires the opening of the bite for their correction; that is, some of the teeth that should have a labial occlusion have a lingual occlusion, or the reverse, being interlocked by the teeth of the opposite arch. In some instances the movement of these teeth, in their correction, is greatly facilitated by opening the bite so that they

will not be interfered with by the teeth of the opposite arch during their movement.

Of the large number of cases of irregularity of the teeth treated, but a small percentage require the appliance to be arranged to open the bite for their correction.

When the jaws are at rest the teeth are not in occlusion, the full occlusion of the teeth taking place only at the time of

mastication, during the act of swallowing, during extreme muscular or physical strain, while enduring pain, and at times during sleep, when suffering caused by some nervous disorder prompts the gritting of the teeth.

The opening of the bite is the operation which consists in the placing of an

upper or lower arch; gold caps, and sometimes plates of gold or silver, were fastened to the occluding surfaces of the molars or bicuspid. Later, vulcanite in the form of a plate, with the sides raised as required, was used for this purpose, the thickened part being made to extend over the grinding surface of the teeth to

FIG. 1.

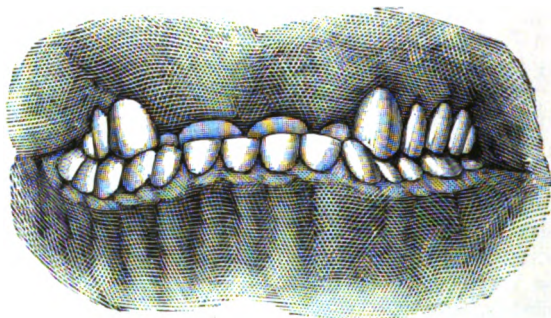
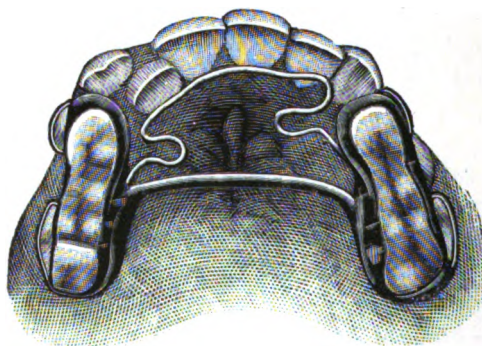


FIG. 2.



object between the upper and lower teeth at the most favorable location, so that the teeth of the arches cannot occlude. The advantage of this practice has been recognized for a great many years, and numerous efforts have been made to construct an apparatus for opening the bite that could be easily applied and retained, and at the same time be of service to the patient during the function of mastication.

With the early methods of opening the bite, blocks of ivory, gold, or silver were employed by being placed between the occlusal surfaces of the teeth, and usually by tying them to those of either the

occlude with those of the opposite arch, as illustrated by the Coffin method.

The opening of the bite is more commonly employed for moving upper incisors from a lingual to a labial occlusion, or lower incisors from a labial to a lingual occlusion.

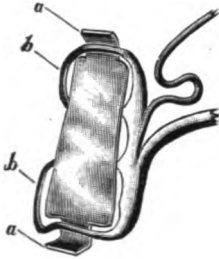
Fig. 1 illustrates a case in which the upper incisors closed back of the lower ones to such an extent as to require the opening of the bite to facilitate their outward movement.

An appliance for moving the incisors outward, and at the same time open the bite, was made as illustrated in Fig. 2. The appliance was removable, made on a

plaster cast in the usual manner with partial clasps, spring clasps, base-wire, and a semicircular spring with U-shaped loops. The spring clasps are passed over the first bicuspid and first molars for anchorage.

The opening of the bite can be begun at any stage of the regulation of the teeth at which it is found necessary. For this purpose the appliance is adjusted on the

FIG. 3.



cast, and a strip of plate metal, No. 36 gage or thinner, is placed across the teeth from before backward. (Fig. 3.) The metal is fitted into the depressions of the teeth as well as may be by successively pressing it gently with a piece of wood, ivory, or a metal instrument, and it need not necessarily be swaged. The ends of the plate metal are then narrowed with the scissors sufficiently to permit one end to be passed underneath and doubled around the mesial wire of the spring clasp on the bicuspid, and the other around the distal wire of the spring clasp on the molar. Wax is then built up on this part, and the appliance is inserted in the mouth for the purpose of securing the bite, and at the same time to determine how much the upper and lower arches should be separated to permit the upper incisors to be moved outward without interference. The appliance is then replaced on the cast, the edges of the wax trimmed smooth, and moldine pressed over it to form a mold. The moldine is taken off to remove the wax, and replaced, with a hole left in the side. Chemically pure tin or jewelers' soft solder is melted in an iron spoon and poured into the mold. This forms a block of metal on the appliance in the space pre-

viously occupied by the wax, causing a good articulation with the lower teeth.

Another method, that is usually preferred, is to build up the raised part by flowing on the plate metal jewelers' soft solder or pure tin, using the soldering iron, after placing a piece of properly shaped moldine around this part of the appliance to form an outline. The surface of the solder is then dressed with a coarse file, and the parts properly finished and polished; or a bar of metal can be soldered to the plate metal and dressed to form a good occlusion.

The upper incisors are moved outward with the looped spring in the usual manner, as shown in Fig. 2, and when they have passed sufficiently in front of the lower incisors the metal is dressed away from the grinding surface from time to time as much as the position of the incisors will warrant until it is all removed, which leaves the appliance free, as ordinarily made, permitting the teeth to rest together in occlusion. The same appliance is used for retaining the teeth when desired.

FIG. 4.



The opening of the bite in this manner, when not excessive, does not interfere with mastication or with speech, the appliance is inconspicuous, is suitable for any age, and for the correction of any form of irregularity requiring the opening of the bite. A few important cases will now be described and exhibited.

Fig. 4 illustrates a case of unilateral occlusion in a boy aged ten years. The upper arch was of good form, excepting that the incisors were very prominent,

with slight spaces between them, and resting over the lower lip. The lower arch was narrow, the incisors extruding and apart from one another.

The occlusion of the deciduous and permanent molars on the left side was good, while on the right side, the lower arch being narrow, there was an entire lack of occlusion, the lower teeth closing inside of the line of the upper ones. From lack of use, the molars on that side had become somewhat elevated in their sockets, causing the upper teeth to lap outside the lower ones to such an extent as to cause a wearing down on the sides where they rested together. This lapping of the teeth prevented the regaining of a natural occlusion without mechanical interference.

With these conditions present, it would be useless to apply simple force for the expansion of the lower arch without opening the bite, as any force applied

on the right side to clear. In addition to the built-up portion on the left side a metal flange was attached to it for increasing the anchorage. The flange was made of plate metal No. 22 gage, and soldered to the lingual side of the anchorage portion of the appliance extending from front to back, projecting upward about three-sixteenths of an inch, and fitting the palatal faces of the upper molars. Opening the bite in this manner prevented the locking of the teeth on the right side, and the flange resting on the lingual faces of the upper molars in oc-

FIG. 6.

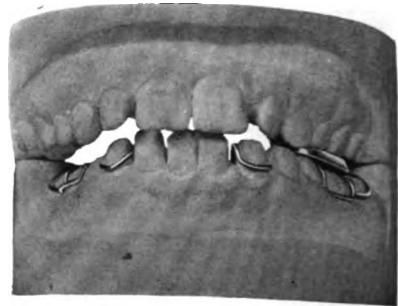
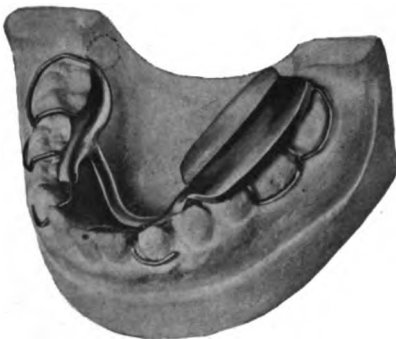


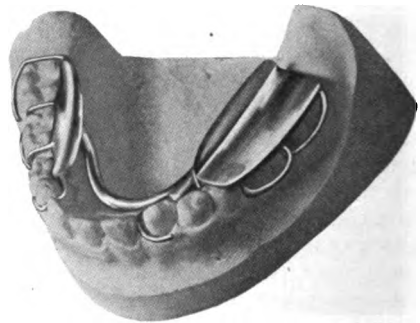
FIG. 5.



clusion prevented the position of any of the teeth changing on that side as pressure was applied by the spring base-wire in forcing outward the teeth on the right side. (Fig. 6.)

The expanded condition of the arch and the same appliance after twelve visits

FIG. 7.



for moving outward the lower right molars would also move the upper molars outward more or less through the occlusion, and the same force, if continued, would move the teeth of the left side of the arch outward, spoiling the good occlusion which existed on that side. To overcome these conditions, an apparatus was constructed as shown in Fig. 5. The usual appliance with a lingual base-wire for expanding the lower arch was first made. The bite was opened by building up with metal the anchorage portion of the apparatus on the left side sufficiently to permit the elevated molars

is shown in Fig. 7, the patient calling at intervals of not less than one week.

The arch being expanded sufficiently,

the flange and the metal block for opening the bite were removed, permitting the teeth on the right side of the arch to rest in occlusion with the teeth of the upper arch, and the same appliance for retaining was continued in use.

The upper incisors were much too prominent and needed to be moved inward, but as the lower incisors naturally antagonized with the gum back of them,

FIG. 8.



their position could not be corrected until the lower incisors were depressed in their sockets. This was accomplished by an appliance adjusted in the upper arch, as illustrated in Fig. 8. It was made with a palatal base-wire, and anchored to the teeth by partial clasps and spring clasps in the usual manner. A semicircular spring with U-shaped loops was arranged to cross the labial faces of the incisors, with the ends, one on each side, passing over the arch at the junction of the canines with the first deciduous molars, to be united with solder to the anchorage portions of the appliance.

To the anterior part of the appliance, back of the incisors and canines, was attached a semicircular piece of plate metal about No. 22 gage, forming a table, resting high above the gum. This opened the bite by directing all of the force of occlusion on the lower incisors, gradually depressing them in their sockets. The table was sustained and prevented from pressing against the gum during occlusion by two small wires—each curved into a small loop, the end of the loop being bent upward and hooked

over the canine—one on each side of the arch, with the ends soldered to the table and anchorage.

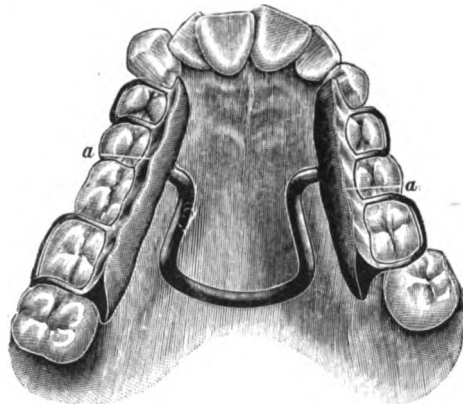
As the lower incisors were depressed in their sockets, the anterior part of the metal table was dressed away a little from time to time, and the loops of the semicircular spring were closed slightly for forcing inward the upper incisors.

Care should be exercised in not causing too much force on the semicircular spring at one time. The anterior edge of the table should be dressed away a little in advance of the movement of the teeth. The only exceptions to this are when the teeth are to be rotated, or when they require to be depressed in their sockets.

The table is sometimes arranged to tip forward in order to form an inclined plane for forcing the lower incisors outward at the same time they are being depressed, or tipped backward for forcing the lower incisors inward as they are being depressed.

An apparatus with a flange, as described in connection with Fig. 5, is utilized in my system for many purposes. In expansion of the arch when the teeth are to be moved to a considerable extent,

FIG. 9.



it is sometimes difficult to harmonize the teeth of the upper arch with those of the lower to establish a good and permanent occlusion. Fig. 9 illustrates an expanding and equalizing device adjusted in

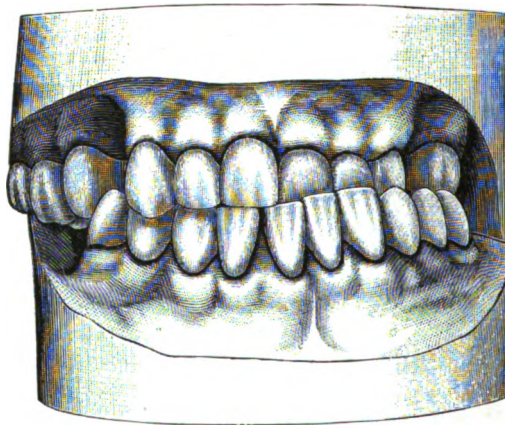
the upper arch, with flanges attached on each side projecting downward from the lingual surface. The appliance is made with partial clasps and spring-clasp attachments, connected by a large palatal base-wire. Spurs are extended from the device to the grinding surface of the upper teeth, in order to prevent the apparatus from being pressed against the gum.

The flanges, *a, a*, are made of heavy plate metal, and shaped to project suffi-

flat metal springs. This device is applicable for similar purposes in the lower arch in conjunction with the lingual base-wire. It seldom interferes with mastication. The appliance can be removed by the patient for cleansing it as would any other ordinary appliance.

Fig. 10 illustrates the position of the teeth of a patient forty-one years of age. It was a case of unilateral prognathism, in which the opening of the bite was necessary for its correction.

FIG. 10.



ciently on the lingual surface of the lower molars, bicuspsids, and canines in occlusion, to guide and cause them to articulate with the upper ones. In locating the flanges on the appliance it is well to take a bite as for making artificial teeth. Their general contour can be crimped to fit the lower teeth, or left smooth. When it is not desired to change the shape of the flanges they can be thickened with solder. Bending outward the base-wire slightly from time to time broadens both the upper and lower arches. The flanges can be bent outward or inward, as required, to further adjust the occlusion. When desirable, the flange can also be extended around the anterior part of the arch, as for correcting a receding mandible. For some conditions the flanges may best be made to project in the form of independent

The left upper canine and the central and lateral incisors closed far inside of the lower teeth, the lower canine and incisors projecting nearly to the upper gum in front of them, and some of the teeth were considerably worn down. Several molars and bicuspsids of the upper and lower arches were absent, making it somewhat difficult to secure a good anchorage for the correction of the irregular teeth. A device was arranged to open the bite, in order to thus facilitate the movement of the irregularly placed teeth, and at the same time to secure additional anchorage by making possible the attachment of the appliance to the upper incisors and canine on the opposite side of the arch. A spring-clasp attachment was arranged over the upper left first molar, the only remaining anchorage tooth on that side, and a spring-clasp attachment over the

upper right second bicuspid—the first bicuspid having been removed—with partial clasps on the first molar, canine, lateral and central incisors. (Fig. 11.) Small short wires were shaped to pass over the incisal edge at the junction of

by building additional solder on the partial clasps on the incisors and canine, which had been left unusually broad, and on to strips of plate metal, one extending from the canine across the space and over the bicuspid, and the other over the molar

FIG. 11

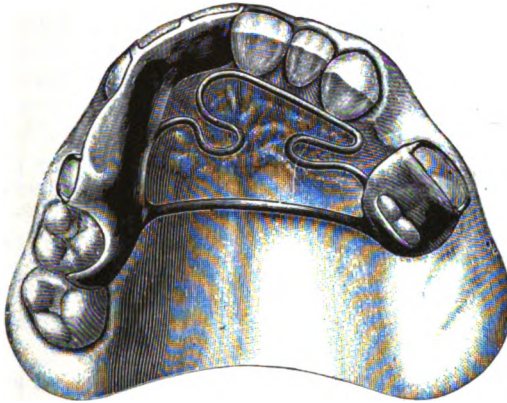
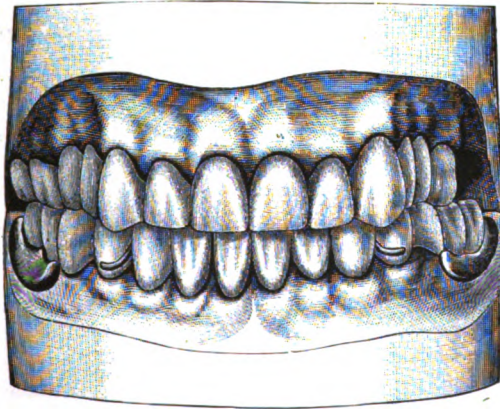


FIG. 12.



the central incisors, lateral, and canine, resting on the partial clasps, with the ends on the labial side extending perpendicularly toward the gum to assist the anchorage and to prevent the appliance from being dislodged during mastication.

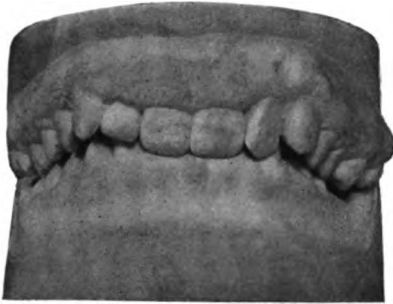
The sides of the device were connected by a palatal base-wire. A semicircular spring with two U-shaped loops was arranged with the ends extending to the anchorage portions. All of the parts were united with solder. The bite was opened

on the opposite side of the arch. The bite being opened in this manner did not interfere with mastication, and permitted the outward movement of the instanding teeth when force was applied by means of the looped spring. The anterior part of the spring was retained by a lug on a collar cemented to the canine. The regulating was completed in a limited time and with no special discomfort to the patient. In Fig. 12 is seen the position of the teeth, and the partial upper and lower

plates, which served for retaining the teeth and which filled the vacancies in place.

Fig. 13 illustrates the case of a patient thirteen years of age. The teeth were

FIG. 13.



very large, and the cheek bones prominent. The upper arch was broad, and the incisors tipped inward. The lower arch was narrow, the molars on the left side and the second molar on the right side closing entirely inside of the line of the upper ones. The incisors were extruded, antagonizing against the gum back of the upper incisors. As the patient lived in central New York, and required eight hours' time to reach my office, he could therefore make visits only at long intervals.

The lower arch was first expanded laterally with an expanding device as shown in Fig. 14. The appliance was anchored

FIG. 14.



by partial clasps and spring-clasp attachments to the bicuspid and first molars. The anchorage portions were connected

by a lingual base-wire, which passed below the gum line, and extending backward, entered the anchorage from below upward. The base-wire, entering the center of the anchorage portion in this manner, permits of its being utilized for the expansion of the whole arch laterally, or for the lateral expansion of the distal or anterior portion of the arch as required. The base-wire extending far back on each side to enter the anchorage, also has the advantage of the lengthened arms, as it is thereby rendered more springy and generally more effective in expanding laterally the anterior part of the arch.

The second molar was badly tipped within the arch, and just erupting. In such a case it is generally found an advantage to move the teeth outward by a spring rather than by the general anchorage with partial clasps. The spring

FIG. 15.



is attached in the anchorage portion of the appliance in front of the irregular tooth, and is made to extend backward, following the gum line to the distal part of the molar to be moved, where it is bent forward on itself to form a loop, with the end resting on the grinding surface. A spring of this shape will not slip toward the gum as force is applied for moving the tooth outward.

When the arch was expanded sufficiently, the lower incisors were depressed in their sockets through the force of occlusion and by means of an appliance worn in the upper arch. (Fig. 15.) The appliance was made with a palatal base-wire anchored in the usual manner. To the anterior part of the appliance

back of the incisors was attached a semi-circular piece of plate metal, similar to the one described in Fig. 8. It was arranged to incline forward, and was supported against the upward thrust of the lower incisors by two small loops of spring wire, arranged to hook over the cusp of each of the canines. The ends of the wire extended below the table to which they were soldered.

Underneath the table and resting near the gum were two finger springs for moving the upper incisors outward. They were soldered to each side of the anchorage portion of the appliance, and made to extend forward in the direction of the lingual faces of the incisors to the opposite side of the arch.

When the lower incisors were sufficiently depressed, the finger springs were

FIG. 16.



bent forward slightly from time to time, in order to move the upper incisors outward (Fig. 16), after which the upper and lower arches were equalized to improve the occlusion. The same appliances were used for equalizing the jaws. For this a wire was extended from the anchorage portion of the upper appliance on each side of the arch, passing over the occlusal surface at the junction of the lateral incisor with the canine to the gum line, where it was soldered to a narrow partial clasp resting in front of the canine; at the same time a wire hook was attached to the partial clasp for holding one end of a rubber equalizing band. The other end of the equalizing band was supported by a similar hook attached to the distal part of the apparatus

on each side of the lower arch. When the apparatus is not well retained by the spring-clasp attachments, it is an advantage to cement to the last lower molar on each side of the arch a collar with a small lug on the bucco-distal surface, and attach to the anchorage portion of the appliance a wire clasp,

FIG. 17.



so shaped as to pass back of the molar from the lingual to the buccal side, resting under the lug, the spring terminating in the form of a hook. (DENTAL COSMOS for 1906, vol. xlviii, p. 282.) Fig. 17 illustrates the present condition of the occlusion, the regulating not yet

FIG. 18.



being completed. Six visits were required for adjusting the apparatus to bring about these changes. A local dentist under my direction added force by bending the springs occasionally.

Fig. 18 illustrates an appliance used for depressing the lower incisors, and

moving outward the upper incisors for a patient sixteen years of age. The appliance was similar to the one last described. The upper and lower first bicuspids had been injudiciously removed by another practitioner. The features were not sufficiently prominent, requiring the

nathous condition had resulted, the lower incisors biting near the gum in front of the upper ones. The bite was opened and the lower incisors were moved backward, after which a chin-cap was applied to force the jaws together and to adjust the occlusion. (Fig. 20.)

FIG. 19.



FIG. 20.



FIG. 21.



FIG. 22.



incisors and canines of both arches to be moved forward, and the spaces artificially filled.

I have used apparatus for opening the bite in a variety of cases, but owing to lack of time, will merely mention one or two additional cases.

Miss S., fifty-one years of age. (Fig. 19.) The early regulation of the teeth had been neglected, and an extreme prog-

Mrs. M., thirty-six years of age. An appliance was inserted in the lower arch to open the bite and move the incisors inward, and another one inserted in the upper arch for moving the incisors and canines outward.

Another similar case, that of a girl thirteen years of age, is illustrated in Figs. 21 and 22.

In concluding my paper, I will briefly

describe an interesting case of prognathism in a child aged two years and ten months. (Fig. 23.)

The mandible was very prominent, the incisors and canines touching the gum in front of the upper ones when in occlusion. The upper incisors needed to be moved outward, requiring the opening of the bite. The irregularity was successfully corrected by the application of a small metal inclined plane. The inclined

FIG. 23.

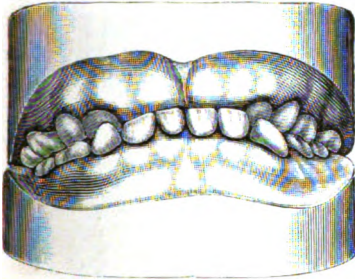
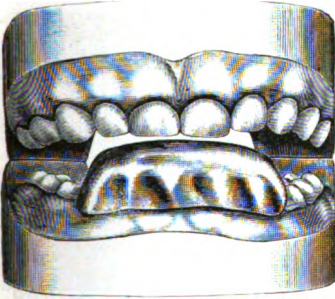


FIG. 24.

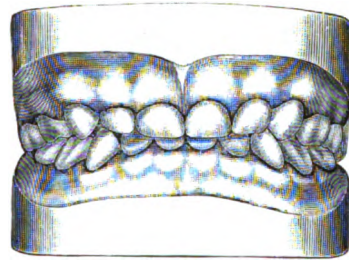


plane pointing backward was attached to the incisors and canines of the lower arch. (Fig. 24.) This had the effect of opening the bite and at the same time of forcing the jaws and teeth of the lower arch inward, and the teeth of the upper arch outward.

The inclined plane was made by joining two pieces of plate gold. A piece of soft wax was first molded on the lingual side of a cast of the lower incisors and canines, the surface of the wax being shaped to project upward and backward in the form required for the inclined plane. An impression was then taken of the labial faces of the incisors and ca-

nines, including the front and upper surface of the wax. From this impression a die and counter-die were made of fusible metal. A piece of gold plate was then swaged to fit the parts forming the front of the incline. The wax was then removed from the lingual side of the teeth, the plate of gold being held in proper position while another impression of the lingual side of the teeth and the projecting plate metal was taken with moldine. The gold was then withdrawn, and the moldine impression removed, after which a die and counter-die were made, and a plate metal was swaged to fit the lingual side of the teeth, projecting upward to join the piece of plate metal fitting the front of the teeth. The two pieces of plate were

FIG. 25.



united with gold solder, and thus an inclined plane and cap were formed. The cap was then roughened on the inside, and cemented over the incisors and canines with zinc oxyphosphate.

The device was applied February 10th, and on May 7th it was removed. The natural force of occlusion had corrected the conditions, as shown in Fig. 25, there having been no special discomfort experienced by the patient. The teeth were retained by the occlusion itself.

Apparatus for opening the bite should not be worn longer than necessary. The opening of the bite in any manner beyond the normal, if continued for a considerable length of time, is likely to prove detrimental to the occlusion. In opening the bite, the muscles are necessarily put on a stretch, and the teeth resting in contact, gradually become depressed in their sockets through the force of the occlusion, owing largely to the tonic contraction of the muscles.

THE EXTRACTION OF TEETH A SURGICAL PROCEDURE.

By **MORRIS I. SCHAMBERG, D.D.S., M.D., New York City.**
PROFESSOR OF ORAL SURGERY, MEDICO-CHIRURGICAL COLLEGE, PHILADELPHIA.

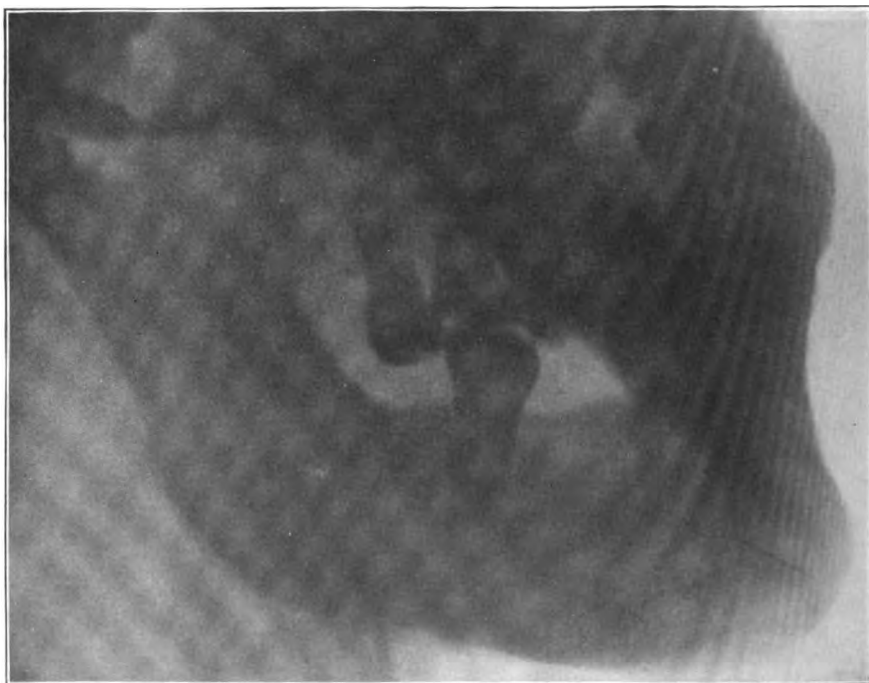
(Read before the First District Dental Society of the State of New York, at its monthly meeting, October 9, 1906.)

WHILE considering the selection of a subject that would interest the members of the society to the greatest degree, it occurred to me that while dentistry has advanced in many

and for that reason I chose the topic announced.

I do not wish to cast any reflection upon the specialists in the large cities throughout the United States and other

FIG. 1.



Radiograph of entire side of a jaw, showing a small piece of a retained end of a root requiring a surgical operation to effect its removal. The root has migrated to a point beneath the inferior dental canal.

respects, there was one particular branch to which had not been accorded the care and attention that it justly deserves,

countries who have adopted modern methods, and who are doing good and conscientious work in this direction,

but rather wish to influence the larger proportion of men who practice the extraction of teeth, and who look upon it as an operation of very little consequence—one which may be done in a slipshod fashion, and which need not be given the care in asepsis and antisepsis that is applied to operations on other parts of the body. With that

FIG. 2.



A character of disfigurement that may follow the extraction of an abscessed tooth if the socket is not properly treated.

end in view it will be my purpose during the course of the evening to call attention to some of the graver complications that arise when precautionary measures are not taken. The lantern slides which will be projected upon the screen are mainly reproductions of radiographs of complicated cases in extraction, which will tend to illustrate certain points which it would be difficult to bring out verbally or in writing.

That dental, medical, and lay publications are reporting deaths from the extraction of teeth is familiar to you all. The very fact that patients do die during

or in consequence of tooth-extraction shows that the operation is one that is not devoid of danger, and one that should

FIG. 3.



An abscess about the root of an upper central incisor, showing the area to be curetted to prevent trouble after extraction.

be accorded a place among surgical procedures that have a mortality rate. Though death is the most dreaded result,

FIG. 4.



An interesting case showing the normal and abnormal healing of tooth-sockets. The unhealthy socket did not become well until a thorough curetting of the diseased area had been performed.

there are other complications or sequelæ which should be guarded against with equal vigilance. Long periods of suffering, the eventual loss of a portion of the jaw-bone, and facial disfigurement (Fig. 2) are among the conditions which

are familiar as evidences of careless methods in tooth-extraction.

FIG. 5.



Radiograph showing a healthy socket of a second molar, which tooth was unnecessarily sacrificed to permit the eruption of an impacted third molar, which, owing to the oblique position which it had assumed, will never be as valuable as its predecessor.

Before the treatment of the teeth, mouth, and jaws became a distinct and separate branch of medicine, it was the custom, as you well know, for sufferers

FIG. 6.



Encysted canine and supernumerary tooth, the removal of which entailed a surgical operation.

from odontalgia in any of its forms to seek relief at the hands of the local tonorial artist, who at the same time was considered an expert in cupping and leeching. Little was done to conserve these important organs of mastication, and only after dentistry had become well established did people begin to appreciate

the value of retaining their teeth. This laudable conservation of the dental organs has brought about the conditions which in extraction operations render the adoption of surgical principles necessary if after-troubles are to be avoided. In the early days teeth were removed upon the first indication of pain. Today it is almost unpardonable to extract a tooth for the mere purpose of relieving pain. Of course, in some instances there may be extenuating circumstances to render the sacrifice necessary, but modern methods

FIG. 7.



Radiograph taken after the removal of the encysted canine and supernumerary tooth.

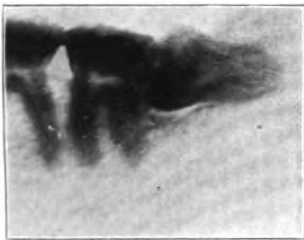
of alleviating pain, coupled with a clear understanding of cause and effect as it applies to dental pathology, stamp such cases as exceptions to the rule.

In the early days little was known about asepsis and antisepsis, and in spite of the crude instruments used, complications were few. This can be explained by the fact that the old extractors were dealing mainly with simple extractions. They removed teeth whose crowns were not entirely lost through decay; whose roots were not enlarged at the end; whose pulps had not through putrescence set up periapical infection; whose peridental membranes had not become diseased, and the enveloping process of which had not lost its normal resilience through inflammatory change. Under such conditions the normal healing of the socket naturally followed in the larger proportion of cases. Today it is exceptional to find

conditions ideal for the healing of the socket. It therefore becomes necessary to adopt measures to prevent, if possible, post-operative disturbances, such as secondary hemorrhage, painful tooth-sockets, osteomyelitis, infection of the glands of the neck, necrosis, septicemia, and pyemia.

It is well to keep in mind that the extraction of a tooth is a bone operation, and that the utmost care is essential lest severe consequences follow. Patients should be aware of the trouble that may result through neglect of the mouth after any operation which entails the shedding of blood, and they should be instructed to return for treatment of the socket if it is in any sense diseased. Whenever a tooth is removed which has been the seat of suppuration, infection spreading through the wound created must be guarded against.

FIG. 8.



A third molar in the horizontal position which was removed under ether without disturbing the second molar.

Professor Robert T. Morris, in a paper which he read before this society a few years ago, referred to the frequency with which death follows the removal of teeth the seat of acute suppuration. These fatalities can be readily avoided if proper pre- and post-operative treatment of the mouth is practiced. Patients—especially of the poorer classes, who are suffering from malnutrition and filthy mouths, and whose systems are unable to resist infections which may lead to a fatal termination—must be subjected to a most thorough cleansing of the mouth before

anything of a surgical nature is done. It is just as important that antiseptic washes be energetically used prior to the extraction of the teeth, as it is to advocate their use subsequent to the operation, and this should be the practice even in the case of mouths that are considered clean.

FIG. 9.



An impacted third molar in the horizontal position which required a careful bone operation to release it without injuring or sacrificing the second molar.

All instruments should be thoroughly sterilized regardless of the character of the case upon which they are to be used. The surgeon who would employ a knife which had not been boiled, or which had been used on a previous case without having since been cleansed and prepared for the operation at hand, would be severely condemned even though the part to be incised was already infected.

In a paper on "The Etiology, Pathology, and Treatment of Troublesome Tooth-sockets," which I read before the Academy of Stomatology of Philadelphia in November 1904, and which was published in the *International Dental Journal* for April 1905, the after-care of the socket was dealt with in detail, so that I will not take up your time with a revision of that subject. I wish, however, to call attention to the fact that all infected sockets should be treated until the pus discharge has ceased, and until healthy granulations line the cavity vacated by the tooth. If this is not done there is danger of infected foci remaining and eventually causing further disturbance.

A NEW ADAPTATION OF THE MICROSCOPE TO DENTISTRY.

By SHIRLEY W. BOWLES, D.D.S., Washington, D. C.

(Read before the District of Columbia Dental Society, January 15, 1907.)

THE object of this paper is to present to you a new microscope for use in the mouth. So far as we know this instrument is the only one that is adapted to our work.

My attention was called to this microscope by Dr. David Fairchild, who is in charge of "foreign exploration" in the Bureau of Plant Industry, Department of Agriculture. In setting forth the features which make it possible for the dentist to use it, I can do no better than to read a letter from Dr. Fairchild on the subject:

1331 CONNECTICUT AVE., N. W.,
WASHINGTON, D. C.,
January 10, 1907.

DR. SHIRLEY W. BOWLES, Washington, D. C.

Dear Dr. Bowles,—Having worked together as we have done upon the adaptation of the Greenough dissecting binocular microscope for dental work, I send you as my contribution to your paper on the subject a few suggestions, which indicate the way this investigation was started.

For over a year, ever since the first time that I looked through this new instrument, its possibilities in dentistry have impressed me. I have spoken to several dentists about it at different times, but never succeeded in arousing their interest in it until last summer when I described it to you. Finding that you were ready to look into its peculiar fitness for adaptation to your profession, it has given me the keenest satisfaction to work out with you the designs for a proper stand, by means of which this new microscope can, I believe, be of the same great aid in dentistry that it has proved to be for botanical investigations.

The facts that led me to believe that this remarkable new microscope was fitted peculiarly for dentistry are the same which have made it of such unusual value in the profession with which I am officially connected.

A comparison of this new invention with

the ordinary microscope will prevent those who would be so inclined at the first mention of the use of the microscope in dentistry, from pigeonholing the idea as something which is not new.

This is an entirely new and original type of microscope that has been on the American market less than three years, and I feel safe in saying that this is the first time it has ever been applied to the practice of dentistry. It is the invention of an American biologist by the name of Greenough, and was worked out in the famous microscopic establishment of Carl Zeiss at Jena, Germany, which firm is the only one that now manufactures it. It is a dissecting microscope, and does not invert the image as the ordinary microscope does; in other words, you can work with your instruments under it without learning that in order to touch a spot in the right of the field you must move your hand to the left instead of to the right, as you would naturally do. This one difficulty in the old type of microscope has effectually barred it from use in the mouth.

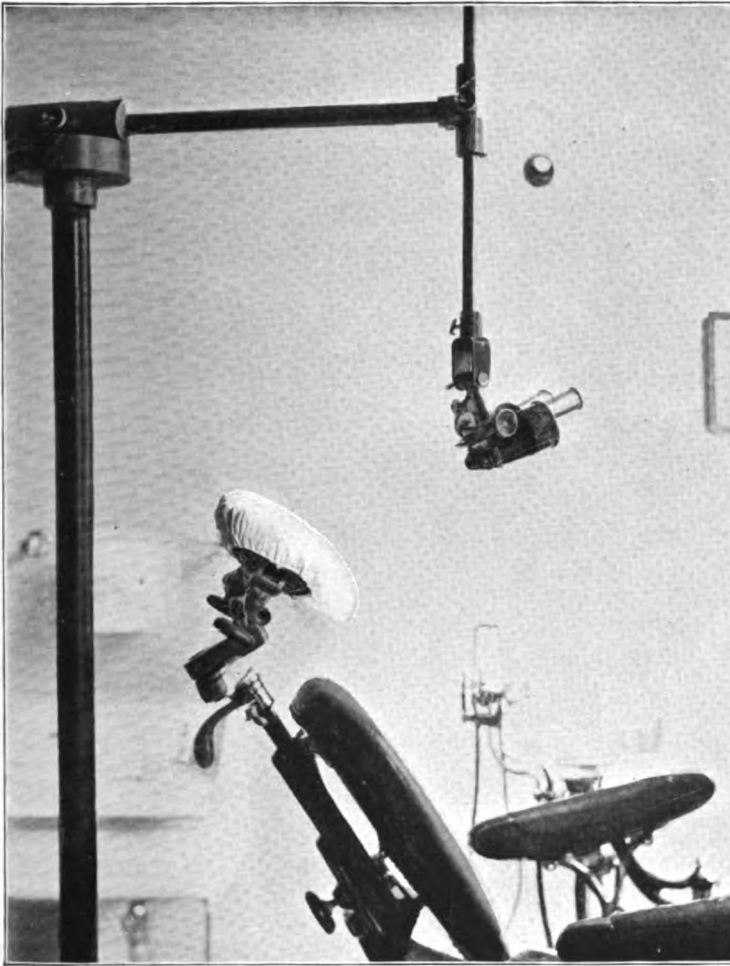
It is a binocular, and at the same time a bi-objective microscope. The old binocular microscopes were none of them bi-objective—that is, none of them had two objectives. The Greenough is essentially two separate microscopes fastened together in such a way that they give stereoscopic vision. This stereoscopic vision is one of its most remarkable features, and makes it rank beside the oil immersion objective as an instrument of research. I think that this character of the instrument will appeal to all in dentistry who are familiar with the ordinary microscope, and who know how shallow is the layer of any object which is in distinct focus at any one time. By means of the two separate objectives Greenough has overcome this difficulty to a large extent, and objects which under an ordinary microscope can only be seen in sections by focusing down from the top, are under this marvelous new instrument visible in their entirety. In dental examinations this feature is of the very first importance, because it is the relation of the form and size, rather than the character, of

a flat but small section of a cavity, that is important.

The instrument has the most remarkable "working distance" of any microscope known; in fact, this point alone is what at first attracted my attention to its possibilities in den-

electric light and a reflector that throws a beam of light on the precise spot that the objectives are focused on, thus illuminating it perfectly. The eyepieces are quite as adjustable as are those of the Zeiss field-glasses, so that by moving them back and

FIG. 1.



tistry. With objectives that magnify from eight to sixty-five diameters—that is, which are four to thirty times as strong as the hand magnifiers that dentists usually employ—a distance of from an inch and a half to four inches intervenes between the objective and the teeth. This distance is enough to allow any of the ordinary dental instruments to be used.

There is attached to this microscope a small

forth the fields of vision can be made to appear as one single field.

The instrument is light and easily manipulated, requiring little of the technique which the old microscopes demanded, and already it has entered the field of the plant-hybridizer, and is being used by gardeners who never in their lives saw through the ordinary microscope.

In botany—especially in the study of plant

diseases—it has quickly become invaluable: while in metallurgy, zoölogy, and in many other branches, it is rapidly becoming quite as necessary an instrument of research as is the old microscope. It has revolutionized the study of corals. I am informed, and the entomologists say that it has revealed entirely new characters in insects.

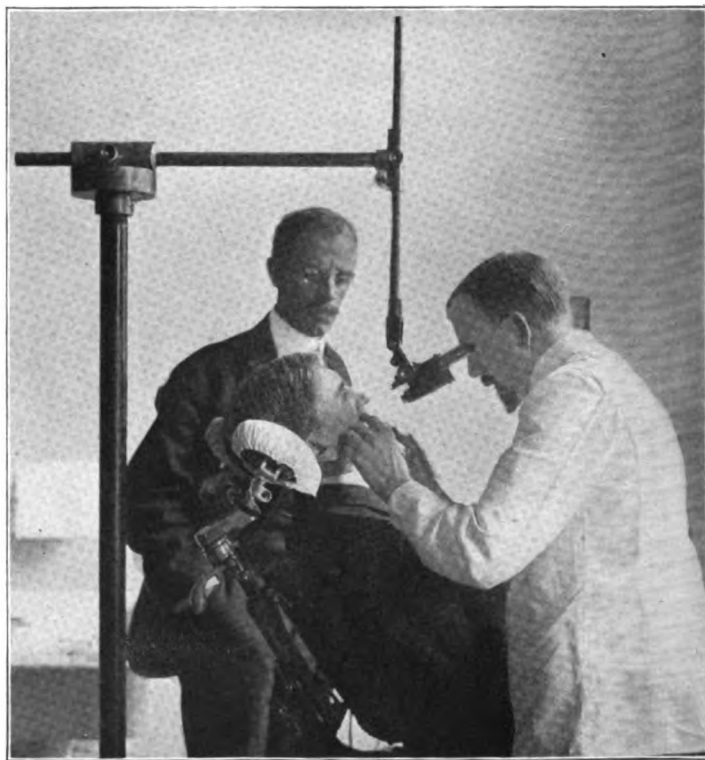
it one of your diabolical instruments to ascertain whether or not the nerve is exposed.

Yours very sincerely,

DAVID FAIRCHILD.

Owing to the impossibility of having the proper light in this room we could

FIG. 2.



I believe that could we get the instrument in position to look into the mouth of a patient in the chair, its own wonderful revelations would win for it the place it deserves to occupy in the art which of all others demands attention to the minutest details. In our joint designs for a stand to hold this instrument, I think we have been in a measure successful, though I trust important improvements will be made in it.

You will find its weak points by practice, but I cannot help feeling that it is to play an important rôle in the future of scientific dentistry. As a representative of that large and silently suffering class, your patients, I trust the time is not far distant when you will look into a cavity before you thrust into

not exhibit the microscope to you to-night. In lieu of that, Mr. President, I will hand you a half-dozen photographs which will show the microscope in focus upon a patient in the chair. These photographs also show the standard which has been constructed to carry the microscope. It rests on a heavy metal base, which is so substantially built that it is rigid enough to keep the instrument in focus. It permits of eight movements, enabling a perfect focus to be easily and quickly obtained. When the focus is once obtained, the horizontal arm can be

swung entirely free from the patient and returned to the same focus at will. When all set-screws are tightened, the operator can rest the forehead against the eye-pieces, leaving both hands free for work if desired.

I wish to call your attention in the pictures to the "working distance"—that is, the distance of about five inches between the nearest point of the instrument to the patient and the cavity or teeth in focus. This is one of the main points which is particularly useful to us. Another strong point in its favor is that the image is not reversed. These two extraordinary attributes permit the use of instruments which are magnified as well as the tooth, and actual work upon the teeth can be done under it if desired.

The last important point is the depth of the layer which is in focus. What this last point means can be illustrated by the case of a lower second molar from which the pulp had been removed. Access to the pulp-chamber was afforded through an occluso-mesial cavity. The canal in the posterior root and one in the lingual portion of the anterior root were easily located. It was believed that a canal existed in the buccal portion of the anterior root, but it could not be found with a broach. The microscope was then focused on the tooth, and the first look was a revelation. The whole tooth was in focus; not only this, but the entire extent of the cavity. It was quickly discerned by the formation of the dentin in the region of the suspected canal that one had existed, and a little drilling opened into the canal and a considerable portion of pulp was removed. The microscope had rendered the operation quick, easy, and precise.

The instrument is invaluable in finding exposed pulps without shocking the patient by using broaches and explorers; also, in lifting out partially decalcified dentin, which comes away in a leathery mass from deep cavities, it will prevent injuring the pulp. When a pulp is nearly exposed, it will quicken our judgment as to whether dentin should be left to recalcify. By using this microscope after a cavity has been prepared, any softened

structure which has been left can be detected, and weakened enamel prisms may be clearly distinguished. It is like proving a mathematical problem, and removes most of the uncertainties of cavity preparation.

Many difficult features of a critical examination of the mouth are minimized, if not entirely cleared away, by the use of this microscope. It can be clearly seen whether discoloration around a filling is due to faulty margins and recurring caries or whether it is caused by staining of tooth-structure by the filling material. Imperfect margins can be seen when an explorer passes over them, and small approximal cavities can be found in interdental spaces where it is impossible to pass an instrument, and where a slight separation is necessary to make sure the presence of a cavity. More than this, in interdental spaces where instruments can pass and detect nothing, the microscope will reveal areas in which the cement substance of enamel rods has been dissolved in the first stage of enamel caries.

By the use of the electric illuminating apparatus, observation can be made on the molars nearly as perfectly as on the anterior teeth. For the distal surfaces of molars it is of course necessary to employ a plain mouth-mirror in order to secure the image upon which to focus.

Professors and demonstrators of operative dentistry would find this microscope a wonderful assistance in the teaching of the branch. The present method in vogue is most excellent, but its one weak point is a flagrant one. It is this: Students obtain their first knowledge of cavity preparation from large technique models. The size of cavities prepared in the models are so out of proportion to the same class of cavities in the mouth, that the first work of students in the infirmary is apt to be destructive of good tooth-substance. Now, if a student could see a properly prepared cavity through the microscope, and have the salient points clearly shown, it would undoubtedly go a long way toward overcoming the embarrassment now experienced, and would benefit both student and pa-

tient. Besides its unique possibilities in the mouth the Greenough microscope is specially adapted to research work in the dental world.

The apology, and no paper is complete without one, is that we cannot present more complete data, but the adaptation of the instrument is young and its use not

perfectly regulated as yet. The hope is that this paper will create an interest in this new acquisition, and that many investigating minds will adopt it. The belief is that its use will open up new avenues of research, and be an immense contribution to exact methods and scientific dentistry.

A REVIEW OF THE METHODS EMPLOYED FOR THE RETENTION OF FILLINGS.

By H. HERBERT JOHNSON, D.D.S., Macon, Ga.

(Read before Section II of the National Dental Association, Atlanta, Ga., September 18, 1906.)

BEFORE proceeding with the main subject under consideration, I wish to explain that while the subject-matter of the paper will of course deal largely with contour gold filling, I would very much dislike to have it construed for a minute that I advocate, even to a small extent, a useless display of gold in teeth. On the contrary, I look upon it as most reprehensible, and advocate and practice the filling of all incipient cavities of decay from the palatal and lingual surfaces where possible. With my efforts constantly directed to the accomplishment of this purpose—endeavors extending over a long period of practice—I have found that it is possible in over fifty per cent. of the cavities occurring in the six anterior teeth. It is hardly necessary to further state, except in defense of my proclivities for progressiveness, that I am not unacquainted with porcelain work and all methods of burnished gold work, as cast fillings, hoods, staple crowns, etc.

I fully recognize that all of the newer methods alluded to must be practiced by everyone who would render the best service possible to his *clientèle*, as we have not yet reached a point where we will not occasionally find a use for contour gold filling, even though we recognize and regret the objectionable display of gold.

It is my belief and I think I can show conclusively, that the methods of preparing cavities for the reception of the filling material, not only in these display fillings but in many of the other class, have in the past been attended with a needless destruction of strong sound tooth tissue, which could not only have been avoided, but by the employment of other systems greater strength of retention could have been obtained. To make my argument, if possible, more convincing, I wish to submit for your consideration a partial review of methods of retention as advocated and practiced by some of the leading operators and writers of modern times.

During and since the days of Marshall Webb, the best operators and writers—including Webb—have almost unanimously advocated for the retention of gold contour fillings, especially in incisors, either cutting a step taking in one-half or two-thirds of what is left of the incisal edge of the tooth (see Figs. 1, 2, and 3), or cutting what is usually termed a doll-head or arm on the palatal side, near to the cutting edge, extending quite two-thirds across the tooth, involving all of the enamel plate and nearly the entire thickness of dentin. (Figs. 4, 5, and 6.) Even the advocates of these proce-

dures have admitted the weakened condition resulting from the cutting of the dovetail or doll-head on the one hand and the increased display of gold from the cutting of the step on the other.

Dr. C. N. Johnson, in a series of very ably written articles running through volume xl of the *Cosmos*, presents on page 813 (figures "10" and "12") illustrations of a method which he advances for the retention of these large fillings.

weak support this method gives to the filling can readily be observed by the practical operator.

Dr. M. L. Hanaford, in an article before the Illinois State Dental Society on the "Preparation of Cavities," published in the *Dental Review*, vol. xii, page 681, says, "The third type of cases includes those cavities in which caries has progressed so far toward the incisive edge as to render unsafe any undercutting for

FIG. 1.



FIG. 2.

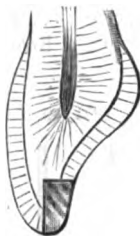


FIG. 3.



FIG. 4.



FIG. 5.



FIG. 6.

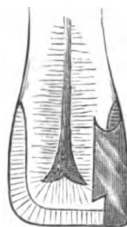


Of course by this method he prevents, for the time being, the extra display of gold which would be occasioned by the step-cutting (see Fig. 3), and anticipating the crumbling, removes entirely the weakened lingual wall of enamel that is left in the cutting of a doll-head retainer. (See Fig. 5.) But it is very plain to even a casual observer that he has left a very weak, partially unsupported wall of enamel on the labio-incisal edge of the tooth.

In the "American Text-Book of Operative Dentistry," edited by Dr. E. C. Kirk, we find on page 192, in a strong article by Dr. S. H. Guilford on "Cavity Preparation," the illustration as seen in Fig. 4, where he extends an arm on the lingual surface, which he recommends to be cut but little deeper than the enamel. The

retention at this point, but where, for esthetic reasons, it is desirable to retain the labial plate of enamel. In such a

FIG. 7.



case the lingual plate is removed for a sufficient distance from the incisive edge root-wise, and extending into the body

of the tooth far enough to make possible a step. This is deepened at the extrem-

FIG. 8.



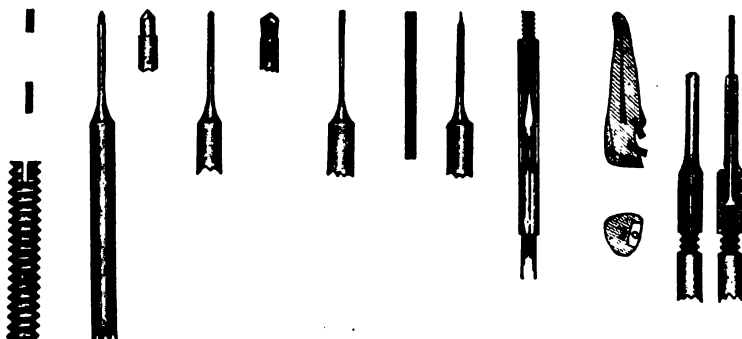
ity, squared, and made retentive." (See Figs. 1 and 2.) This suggestion of Dr.

the pulp-chamber and pulp-canals. (See right side of Fig. 8.)

I feel that it is hardly necessary to go farther into a review of such methods, as I believe these few will suffice to establish the fact that they constitute the prevailing methods of retention of this class of fillings, if indeed, there be anyone who would be prepared to deny it at all. I also believe that all will admit that in these methods there is necessarily a great sacrifice of sound tooth tissue, and in some instances a great display of filling from excessive cutting.

The only other means heretofore brought forward to improve these de-

FIG. 9.



Hanaford is clearly after the method of Dr. Johnson, as can readily be seen by comparing the two systems.

In this connection I would also refer to the idea advanced by Dr. Weld of New York, published in a leading text-book. This method is illustrated in Fig. 3, compared with that advocated by Henry Sewell, M.R.C.S., L.D.S., of England. (See Fig. 7.) Dr. Sewell's method would have the advantage from an esthetic point of view, but would be at a disadvantage as to strength of retention.

In *Items of Interest*, vol. xxvi, page 130, appears an article by Dr. Hanning, read before the Second District Dental Society of the State of New York, in which he advocates a kind of post retention for these display fillings. This idea, however, seems to be limited to those devitalized teeth where use can be made of

structive methods—at least the only one which has come to my knowledge—is the little anchor screws sold by The S. S. White Dental Mfg. Co. and illustrated in Fig. 9. These screws have been used to a limited extent in very favorable cases, but they have never been popular on account of the clumsy size, and the difficulty in securing the accuracy necessary for their adjustment, as they depend on the holding power of the threads in the dentin for support. They also require a hole to be drilled, the size of which weakens the body of the tooth very materially.

As a general substitute for all these methods of preparation of cavities and retention of filling, and especially those contour fillings involving the restoration of the corners of incisors, I wish to offer the following idea, which if not new, at least possesses some novelty, and which

has not thus far, to my knowledge, been illustrated or published; it has in its favor the essential points of being extremely simple, strong, and practical: Instead of cutting away so much strong

num wire, No. 20 gage or smaller, according to the size and thickness of the body of the tooth.

To give them an increased holding power, they are barbed on the edges, bent at an angle, and flattened at the end that is to be embedded into the body of the filling. Being thus flattened—which is quickly and neatly done by crushing with a pair of strong pliers—it will be readily observed by studying Fig. 13 that the bulk of the metal of the stay is all there for strength, and yet the flattening process has given it such shape that the strength of the gold has been but little impaired by having it thus flatwise embedded into it. The little wire stay can be easily adjusted, even in narrow spaces, by taking care to carry it to place with the flattened end projecting either labially or lingually, until it is pushed clear up into the previously drilled hole, and then turned downward until it assumes its correct position, as is seen in Fig. 12.

FIG. 10.

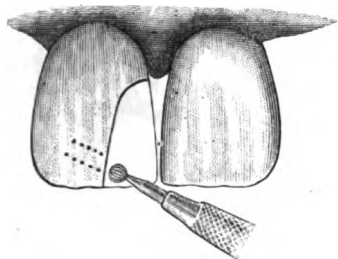
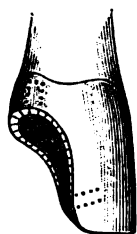


FIG. 11.



enamel and dentin in the formation of the steps for anchorage, it is only necessary to remove all weak walls, clear out the decay, and polish the margins of the enamel. Next make a slight groove, undercut, or any other shaping desired, at the approximo-gingival margin of the cavity, from which to begin the filling. At the incisal edge take a very small round bur—about No. $\frac{1}{2}$ of the “revelation” type, and bore a hole into the dentin between the two plates of enamel. Begin at the extreme incisal edge of the cavity, and proceed downward and backward approximately at an angle of about forty-five degrees, just missing the posterior horn of the pulp. (See Figs. 10 and 11.) Extend this hole deep enough, using judgment in each case, to give firm anchorage for the little iridio-platinum retainer which is to be cemented into it. (Figs. 12 and 13.) These little stays are preferably made of squared iridio-plati-

FIG. 12.

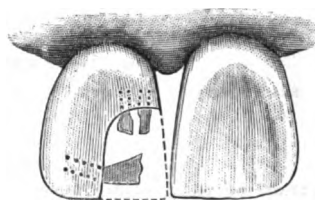
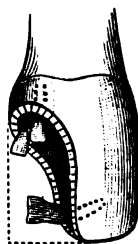


FIG. 13.



These little wire retainers are exceedingly strong, and will stand an enormous amount of force. By their use we sacrifice a minimum amount of valuable tooth tissue, reduce the display of gold to the

smallest possible, and also get a much stronger anchorage for the filling. They are applicable to many other classes of

In Fig. 15 the application of the gold is shown, half built in, about the retaining wires seen in Fig. 14.

FIG. 14.



FIG. 15.

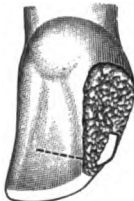
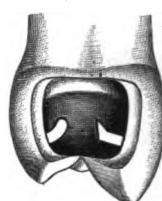


FIG. 16.



cavities, as will be readily suggested to the practical mind. The simplicity of making and adjusting appeals at once to the progressive reasoner.

A suggested application is further shown in Fig. 16 which might extend the field of usefulness of these stays beyond that already demonstrated.

THE F. D. I. COMMISSION ON HYGIENE.

By Dr. LYMAN CURTIS BRYAN, Basel,

PRESIDENT OF THE SECTION OF HYGIENE AND PUBLIC DENTAL SERVICE OF THE F. D. I.

(Abstract of address delivered at the F. D. I. meeting at Geneva, August 1906.)

THE work of the Commission on Hygiene and Public Dental Service should be the most important and useful to humanity of any of the commissions of the F. D. I., and should have the support of every member of this great International Federation. The work of attending and treating the needy poor is one which should appeal to every man with human and charitable instincts, and should not only interest the dentist, but also appeal to every human heart. There is not one of us who has not felt the pangs of regret that there is so much dental work to be done in the world, and that there are comparatively so few to do it, and worse still so few who appreciate it. Not but that there are plenty of den-

tists to do thorough and conscientious work for the favored few, but where is the host that is to work for the millions of needy human beings who have neither the opportunity nor the means to have their dental work done, even if they have the inclination?

In my hospital dental work in Basel I found that the public was not prepared for conservative dentistry—that is to say the class of people, the servants and laborers and lower classes, who came to the infirmary and the dental clinic only came to be relieved of their present sufferings; and even where the work was gratuitous they would allow nothing to be done, as a rule, for those dental organs which did not at the moment cause incon-

venience and pain. I am convinced that even if dental services were furnished gratuitously by the state, a very small portion of the needy poor would apply for conservative dentistry. Either the pain connected with dental operations is sufficient to frighten away the ignorant, timid, and improvident lower classes of humanity, or they do not appreciate the value of teeth in good order, having never possessed such from youth up. Those who have had experience with the country people in the farming districts of Switzerland tell me that there is absolutely no demand for conservative dentistry among these people, and that all they require, as a rule, is to have teeth extracted and replaced by artificial ones.

Not only is this the case in Switzerland and among the poorer people, but it is the general demand in many countries, according to information furnished me by members of this association who come from all parts of the world. Therefore I hope that you will discuss very carefully and conscientiously the first question which I have submitted for discussion on the program of this meeting, viz:

How shall we reach, interest, and educate the public in dental hygiene?

Before the dentist could commence conservative dentistry for the needy public, there is a great work to be done in educating the poorer classes in the personal care of their teeth. To attempt to do our delicate and complicated operations for patients who have no habits of dental cleanliness would be most ill-advised charity, and before we can help this class they must be taught their own duty to themselves, and my opinion is that our efforts should be directed almost entirely to the rising generation. The work before us is of such gigantic proportions and the means at our command are so limited and the workers so few, that we will have to be content with small beginnings and be satisfied if in the next few years we can secure in every large city of the world a school dental clinic for the younger—the very youngest—of the coming generation. Beginnings have already been made in this direction in various countries; probably the greater achieve-

ments have been accomplished, and the ground broken most thoroughly in preparation for this great work of bringing up the children in the way they should go, in that great progressive country north of us, united Germany. Here we see Strasburg to the front with its wealth of experience in experimental ways, and the man who has done the pioneer work so successfully, Professor Jessen, who is with us today, will give us most valuable information and the results of his labor and experience. I am sure we will all take home with us from his lecture many valuable points for our guidance in establishing school dental clinics in various parts of the world.

Professor Jessen is probably the man who can best answer our second question, viz:

How should the school children be treated to assure a useful dentition through life?

There are many others here and many others not here who are in sympathy with us, who have given much thought and attention to this question. This is really the greatest question before us. I am exceedingly disappointed not to be able to present for your consideration the thoughts and suggestions of the officers and members of this commission in various countries, but my appeal by circular letter to the members for information has not brought one essay or paper in advance of this meeting which would be a guide and help to me in addressing you today. There are ready, however, a few considerations, reports from various countries to be made by the delegates themselves, and I am sure that with all the earnest workers that I see about me there will soon be the dawning of a bright day for public dental service throughout the civilized nations of the world.

Let us all go earnestly to work and let every delegate here make a beginning in his own country to interest the people in public dental clinics. Let us show them what has been done in other cities and present to them statistics of the good work already accomplished, and stimulate national and local spirit to undertake similar charitable work and contribute

generously with financial support; but above all, let us through our local dental societies awaken an interest in the public and educate them to appreciate what we desire to accomplish. The work we do in this international commission—and in fact all the work of the Federation—is advisory; the actual work must therefore be carried out by the dental societies in the various countries, and it is our duty as members of this commission to see that our national and local societies take the necessary steps to bring the results of our discussions and the conclusions reached by the delegates from all countries here assembled, and working in the interest of humanity without national or local prejudices, before their governments and other bodies who should take action in the interests of the suffering poor.

I believe we shall be able to convince the most skeptical and parsimonious government official that it is for the national good and is necessary for the national physical development that the teeth of the rising generation be most carefully looked after, and that public clinics for this purpose should be carefully organized and generously supported, should be provided with thoroughly equipped instrumentaria and the work be done by thoroughly educated dental surgeons, not by students or by men not specially trained in dental colleges or dental departments of universities. We should be able to convince them that this work is more important than any other prophylactic or hygienic measures already undertaken and under government supervision for the welfare of the public. We are all convinced, as dental surgeons of experience, that the money invested in providing healthy mouths in the rising generation and instilling in the public mind the principles of personal dental hygiene will be saved tenfold in money now invested annually in general hospitals and other sanitary institutions where the diseases treated can in a large proportion of cases be traced directly to malnutrition, infection, defective assimilation, nervous and other disorders resulting directly from defective dentures.

All countries have recognized their duty to care for the suffering poor, and are spending millions in treating the after-effects of human diseases resulting in many cases directly from bad teeth and diseased mouths; whereas, if thousands had been spent in caring for these mouths early in life, these diseases and the resulting suffering would have been spared and the usefulness of thousands of citizens greatly enhanced, not to mention their freedom from local dental pain.

It is the universal opinion of those best able to give an opinion that money invested in school dental clinics by the government is the best investment that can be made for the health of the people, and that dental treatment early in life prevents more diseases in after life than any other prophylactic measure taken by governments, not even excepting vaccination.

Therefore let us present these facts to our respective governments and suggest early action and a trial of a school dental clinic for the primary classes, as the most advisable and reasonable beginning of this great work that is before us. We are convinced that the school in early life is the only place to begin this work, and that on the basis of results here achieved the greater work can be planned and gradually extended. Let us not undertake to commence more than this elementary work, which, in the present state of governmental indifference and public ignorance of the crying necessity of this long-neglected branch of public hygiene, is all we can hope for or accomplish.

I am of the opinion that our third question—

How shall the needy public be treated?—can only be answered by saying, "Let us relieve their present sufferings as speedily as possible in our private clinics or by securing the appointment of dental surgeons in the hospitals, and demanding in every public hospital a dental surgery where those not actually confined to bed or those convalescent can be conservatively treated and their mouths put in order before they are discharged from the institution as cured and as prepared to undertake life's arduous duties again." Let us insist, through our local dental

societies, on this first step being taken by those in authority, and this beginning will sow the first seeds in the best of soil.

The gratuitous distribution of tooth-brushes in the schools and the examination of school children's teeth has been so thoroughly discussed and unanimously approved by this International Dental Federation that the far-reaching advantages of these preventive measures may be considered as an established fact.

The publication and distribution of a booklet on dental hygiene by the national dental societies or under the supervision and authority of the Federation is a subject which should occupy your very care-

ful consideration, as well as the establishing of a definite plan of work for the commission.

Now that we are to have regular annual meetings of the Federation, we should plan our work so that the results of our conferences and the conclusions reached will bear fruit in the various countries whose delegates attend this congress. It is only through them that we are to accomplish the results that the Federation is striving for, and my last word to you is an appeal to one and all to use his personal efforts *at home* that the work done here may not lie a dead letter in the archives of the Federation.

THE REPAIR OF PORCELAIN FILLINGS.

By JOSEPH HEAD, M.D., D.D.S., Philadelphia, Pa.

(Read before the Reading, Pa., Dental Society, February 7, 1907.)

MANY conscientious porcelain workers declare that porcelain fillings should not be repaired. To patch them, they say, is a confession of failure—an admission that the operator was not able to carry out his original plan—and therefore the chipped filling should be replaced with a new one. This is the rather severe attitude of a stern idealist who sticks to principle through everything, and as such these opinions should receive sympathetic and respectful consideration. It is unquestionably true that a patched porcelain filling is not so perfect and beautiful a piece of work to examine critically as a perfect one. Such a filling when viewed closely is in no danger of passing unnoticed, and so is not *per se* so artistic. This admission, however, cannot be held as a final condemnation of the practice of repairing porcelain restorations. On the contrary, the vast majority of chipped porcelain fillings can be so successfully repaired as

to be still unnoticeable to the general observer.

So the proposition resolves itself into two questions: Are we to be exact copyists of nature in every detail—like for instance the great artist Meissonier? or are we to be impressionists who only care to give the impression of perfect teeth to the outside general observer? We must remember that the impressionist may be equally true to an ideal when he feels that so long as our fillings look well from outside of the mouth, it is a question of indifference how they appear when examined by the mouth-mirror, if they are wholesomely preserving the teeth and performing their proper functions of mastication and interdental space protection.

It must also be remembered that we owe ideal justice to our patients, and we should not compel them to undergo the pain and expense of new fillings unless they are going to be reimbursed by receiving practical benefit. I would not be

understood as decrying ideals; dentists cannot do good work without them; no work can be too artistic or too good; but let our ideals be practical. If an inlay cannot be inconspicuously patched so as to be sightly, strong, and tooth-saving, it should be replaced with a new one; but where a few minutes' work will make the filling as good if not better than before, it is ridiculous not to choose the lesser operation.

The one great objection to porcelain work lies in the fact that porcelain edges will chip when they are exposed to the direct force of the occluding teeth. There are but two ways of meeting this difficulty: One is to place the edge so as to avoid such occlusal shocks; the other is to boldly mend the edges when they crumble. The former cannot always be successfully done, but the mending can be accomplished in such a way as to make the fillings more likely to last than before the fracture occurred, which is not the case when an ordinary gold filling is repaired. For when decay sets in around a hammered gold filling, the microscopic spaces that usually occur between the metal and the tooth may lead the decay from the margin directly to the bottom of the cavity. Thus in cutting out the spot of decay and filling it up with gold, there is no real security that caries may not have been left underneath. But with an inlay we know that the defective edge with its consequent decay does not extend below the hard cement. So having cut to that decay we can fill the defective line in perfect security that no infection has been overlooked. It has been proved conclusively that a one- to two-pound blow delivered on the edge of a porcelain filling by an occluding tooth will chip or powder the edge. There is a possibility of such an accident any time we eat. On the contrary, gold or amalgam flow before the force of percussion. If, therefore, we could combine the plasticity of these metals with the hardness and beauty of the porcelain we could have the almost ideal filling. And this is what we do, to a large degree, when we mend chipped porcelain with gold or amalgam; for with an edge so mended the force of mastication tends to hammer the gold into the

edge and make it more perfect, rather than tending to cause a recurrence of the trouble.

The method of procedure is as follows: Cut out the defective line with a small inverted cone, cutting in the direction of the tooth rather than the porcelain. Dry the cavity with alcohol and hot air. Have moss fiber gold, properly annealed, in small pieces, near at hand. Mix some creamy cement, place it in the cut-out groove, and squeeze this cement out with suitable pieces of moss fiber gold, being careful to remove all excess of cement. When the cement has set, condense the gold and finish in the usual way with either hand or mallet. If amalgam be used the procedure is practically identical, only the cement is squeezed out with the amalgam instead of gold, and hardened by wafering in the conventional way. And let us note an advantage for this method that has not perhaps been given its just due: When a gold or porcelain filling is cemented into place the entire cement line is just as large as the largest grain of cement powder in the mix. But with gold or amalgam flowing around the few large grains, the cement line becomes almost imperceptible.

The places most likely to need mending, as before stated, are those that receive the direct force of mastication, such as the grinding surfaces of molars and bicuspid. The fillings on the labial aspect of incisors, canines, and bicuspid are not subject to such stress and therefore are not likely to need mending. But with these in a certain percentage of cases a black line will appear. This, from the very fineness of the cement line, is most difficult to remedy, but it may usually be accomplished in the following way: Put on the rubber dam. Wash the dark line with alcohol and afterward with ammonia; dry with a hot air blast. Then flow 25 per cent. pyrozone into the darkened fissures and dry instantly with as hot an air-blast as the patient can bear. This will usually render a part of the line white and clean, when the pyrozone can be reapplied and the procedure repeated until the stain has been entirely

removed. The line can then be refilled with cement and the filling will be as good as new.

When porcelain corners of incisors chip on the cutting edge between the tooth-structure and the filling, leaving a little three-cornered nick, in the vast majority of cases a new filling will give the most satisfaction. But even these nicks can sometimes be cut out from the

back and filled as previously described, so that the small amount of gold that shows in front will be invisible from a distance of ten inches. This, from the impressionistic point of view, is all that is necessary; for, as a very bright young lady once said speaking of the fine gold line, if anyone gets nearer than ten inches, even then he is not likely to see it.

A SYSTEM OF UTILIZING ATMOSPHERIC PRESSURE FOR THE RETENTION OF LOWER PLATES.

By D. H. YOUNG, D.D.S., Attica, N. Y.

(Read at the November meeting of the Eighth District Dental Society of the State of New York.)

PHYSICAL science tells us that the atmosphere exerts a pressure of 14.7 lbs. to the square inch on all objects on the earth, our bodies included. Since the average man has a body surface equal to about 16 square feet, we find by multiplying 144—the number of square inches in a square foot—by 14.7—the number of pounds' pressure on each square inch—that it equals 2116 pounds, or over a ton, to the square foot; and since we have 16 square feet of surface on our bodies, the pressure upon each of us is over 16 tons. This gives us an idea of the strenuous life we are compelled to live. Such high pressure, however, is our birthright, and not our choice.

In this principle there is nothing new to us. We all familiarized ourselves with it when boys in school, and yet few realize that it is an ever-acting law of nature, which when brought under our control may be made to serve many desirable purposes.

It has been very successfully applied in the retention of upper dentures, which not so very long ago were held in position by springs; but it yet remains for us to

find out how we may best apply this force to the holding of the lower teeth in position. This brings us to the much-discussed subject of plates, but shall we not stand justified if by considering this subject tonight we may be able to help each other in solving this problem of lower plate retention?

Doubtless many have their own methods of securing atmospheric pressure on full lower plates, and some may never have tried it at all; so, in the hope of bringing out a discussion on the subject, I shall endeavor to describe a method which I have used for several years for securing atmospheric pressure on the full lower plate. For impression material I have used modeling compound—Perfection compound has given as good satisfaction as any. Plaster of Paris, of course, is an ideal impression material, but it does not give the kind of impression that is desired in this method.

The compound is warmed to a consistency at which it will adapt itself readily to the shape of the mouth, placed upon the tray, put in the mouth, and pressed down almost as far as you desire it to

go. Then wait for a minute or two until it hardens slightly. During this interval of time I have my assistant direct a current of cold air into the mouth from a rotary fan in the dental engine, which procedure chills the outer layer of the compound and prevents it from flowing away from the jaw when pressure is put upon it. While the layer of impression material that is in contact with the tissues is still warm and plastic, the tray is pressed down just a little farther, and then held steadily—with about half the force used in pressing it down the first time—until it is quite hard. The tray is then removed and the cast is poured.

In order that we may know why we proceed in this manner, let us go over the taking of this impression again. In the first place, when the material is put in the mouth and pressed down we get an ordinary impression; after it is allowed to stand a little while and the outside is chilled and pressed down a second time, the impression is changed from the ordinary one, but in what way? When pressing down on the tray the second time, the hard ridge of the alveolus cuts just a little deeper into the impression material, and remains practically unchanged, while the soft tissues down on the sides of the gums, about where the border of the plate comes, are com-

pressed slightly. When the plate is made on the model from this impression and put into the mouth, the margins of the plate are sealed all the way round, and this converts the whole lower surface of the plate into one great suction-pad—if we may use that term.

One of the most delicate parts of the operation is the trimming of the plate to just that line that will best seal its borders, for if it be too long it will give the muscles an opportunity to displace it; if too short it may allow the air to pass in, and thus defeat our whole purpose.

It is self-evident that the upper plate is retained by air-pressure against gravity, while the lower plate adds its own weight to atmospheric pressure; and so, compared with the upper, the lower has twice its own weight to add to the atmospheric pressure, thus showing that it is a better subject to be retained by such pressure than the upper plate.

The lower plate has always been a *bête noir* in dentistry. Of course we all would rather fill, treat, crown, or bridge to meet the conditions we find in the mouth, but occasionally there come before us conditions for which the science and art of dentistry has nothing better to offer than a plate. How necessary, then, both for the comfort of the patient and for our own credit, that it be made to stick!

PROCEEDINGS OF SOCIETIES.

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Meeting, Atlanta, Ga., September 18-21, 1906.

(Continued from page 314.)

SECTION I: Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

Chairman—B. L. THORPE, St. Louis, Mo.

Secretary—D. O. M. LECRON, St. Louis, Mo.

FIRST DAY—TUESDAY.

THE first meeting of Section I of the National Dental Association was called to order by Dr. Burton Lee Thorpe, chairman, on Tuesday afternoon, September 18th, in the ball-room of the New Kimball House, Atlanta, Ga.

The first order of business was the reading of a paper by Dr. RICHARD SUMMA, St. Louis, Mo., entitled "Some Thoughts Concerning the Contact of the Teeth," as follows:

SOME THOUGHTS CONCERNING THE CONTACT OF THE TEETH.

Fallacious and indistinct conceptions have ever tended to enrich nomenclature. Unfortunately, words thus coined not only failed to elucidate, but, on the contrary, complicated matters. In nomenclature, just as in mechanics, simplicity follows the solution of a problem.

In the dental world the pathological condition most commonly known as pyorrhea alveolaris is an example of such an unsolved problem, whose many names bear evidence of an indistinct and fallacious conception. An epithet may offer some consolation and even satisfy the self-esteem of some writers, but it never adds one iota to the solution of any problem.

And so it is in regard to the contact of the teeth, both approximally and oc-

clusally, especially the latter. Hasty observation of the interdependence of the dental arches has prompted the necessity of a more or less complicated terminology to designate harmony and the various degrees of inharmony.

While in case of so-called pyorrhea alveolaris its obscure etiology and its varied manifestations may be responsible for the continued use of its superabundant names, such reasons no longer exist for the diverse employment of terms to express the contact of the teeth of opposing arches. Although the etiology of malposed teeth is as yet but imperfectly understood, we are so cognizant of sufficient facts concerning the contact of the teeth as not only to preclude the necessity of a complicated terminology, but to plainly indicate simplicity of terms.

We know that the teeth of man erupt to take their places in a fixed order. Thus no one doubts or disputes that it is normal for the central incisors to erupt on each side of the median line; adjoining these the lateral incisors, canines, first and second bicuspids, first, second, and third molars take their places. After recording this arrangement of teeth as the accepted one, I was just about to state that their approximal contact had never been an issue of dispute—when I became mindful of the discussion of Dr. I. B. Davenport's paper in 1887. (See *Cosmos*, vol. xxix, pp. 413, 445.) One

must read the entire discussion to fully appreciate the prevailing misconception at that time—for which Dr. Arthur's teaching appeared to be responsible—as to the scheme of approximal contact of the teeth. It seems that this article, entitled "The Dental Arches of Man," embodied the first ray of truth which penetrated the delusion of that day. He directed the eyes of the thinking dental profession to that scheme of nature which provides a methodical approximal contact of teeth. This fact led the same author to the realization that for the fulfilment of their function the teeth of one arch must come into contact with the teeth of the opposing arch in accordance with an equally formulated design.

To express the contact of the teeth of opposing arches Dr. Davenport uses the word "articulation." Numerous other words have arisen to designate this anatomical relation. Many of these resulted from a different significance attributed to this contact, and most of them were the outcome of the innate unwillingness of one author to subscribe to the diction of another. It matters little what we call this contact, whether it be articulation, occlusion, interdigitation, antagonism, mordex dentalis, odontarhosis, or green cheese, just so we understand the picture to be conveyed by the word. Since we must call it something, I hope that in the near future all orthodontists may see fit to adopt the word occlusion, also recommended by Dr. Guilford in a paper read before this association last year. (See *Cosmos*, 1906, vol. xlviii, p. 135.)

Not only did the naming of the contact of the teeth of opposing arches create much discussion, but authorities also found difficulty in agreeing upon a picture and an adjective to designate a contact which is according to the standard or rule that is observed or claimed to prevail in nature. Some doubt has been expressed as to the justification of denoting a certain occlusal contact as "normal," because the design of nature in many instances is obscure. Admitting the frequent difficulties encountered in drawing a line between health and dis-

ease or between normal and abnormal, I believe that such doubt in case of the occlusal contact of teeth is as groundless as a doubt in regard to their alignment in the arch would be. It is my opinion that natural selection, which prevails in every phase of nature, tends to reproduce organs best adapted for the performance of the functions demanded of them so that they may endure in the struggle for existence. It seems to me but logical to assume that the germs transmitted for the jaws and teeth in any given case tend to reproduce jaws and teeth primarily indicative of the genus to which the parents belong, and that they only secondarily impress upon these organs the family characteristics of the more immediate ancestors. Therefore we would expect to find in man jaws and teeth peculiar to the *genus Homo*, and varying within certain limits according to racial and family characteristics.

No one who has been in the general practice of dentistry for any length of time could fail to observe identical malposition of the teeth of parent and child. To what extent these cases are hereditarily transmitted characteristics, and to what extent the conditions are due to similar environments, is so difficult to decide that I have no desire to argue the question, but I wish to state my belief that the orthodontist's duty is plain in either case. He must strive to place these teeth into the occlusal relations which are normal for that type of the genus. It is well established that the teeth of all mankind are not only of the same pattern and alignment in each arch, but that an identical occlusal arrangement prevails with equal certainty. The variations consist in a slight difference in the curvature of the arches and a difference in the position the dental arches occupy upon the bodies of the maxillary bones.

Many discussions of orthodontic problems have been suggestive of the idea that for certain types of the *genus Homo* thirty-two is too large a number of teeth, and that crowding of these reveals, therefore, a plan of nature to eliminate excessive teeth, especially for the purpose of

improving the facial contour. If we stop to consider that utility is of first importance in determining everything of which we are conscious, the absurdity of this intimation becomes apparent. Beauty is secondary. We unconsciously accept as a standard of beauty that which utility inevitably forces upon us. Thus the African admires the prominent lower part of the face due to physiological prognathism. Prognathism with these people is a matter of utility. The Caucasian admires the facial contour resulting from orthognathism, which is also a result of environment, consequently a matter of utility, which thus creates a standard of beauty.

The dependence of facial contour upon the underlying osseous structure and the relative standard of beauty brings to mind the able article of Dr. Bebb, entitled "Disproportion in the Dimensional Relations of the Jaws and Teeth." (See *Cosmos*, 1905, vol. xlvii, p. 660.) He writes as follows: "If I interpret the orthodontists correctly, they would say the teeth of the bulldog are in perfect harmony with the supporting integument, only you must establish 'normal occlusion' by mechanical procedure, protrude the jaws and contract the arches until the teeth occupy their normal position, such as the conditions were before man interfered.

"The result would be what? A dog with body, limbs, and crania all in good proportion, and with a long, narrow snout, like a wolf or coyote.

"Shorten the mastiff's arches until this noble animal resembles an overgrown pug dog, and would you not arrive at the conditions which the orthodontists seek in the human?"

Dr. Bebb's misinterpretation, for such it is, seems to be quite prevalent. First of all, if an occlusionist were asked to suggest a means to improve a bulldog's denture he would certainly not think of reducing the protrusion of that freak's mandible. On the contrary, he would endeavor to exaggerate this unnatural protrusion in order to enhance the relative beauty of this degenerate. However, we must keep in mind that the bulldog is

not the result of natural selection, and this very feature of protrusion of the mandible at which the fancier aims would disqualify this poor freak to endure in the struggle for existence. The occlusionist is aware of the fact that the bulldog's relative beauty is enhanced in the same proportion as his ugliness increases and the usefulness of his teeth for the purpose of mastication diminishes.

Let us forget freaks, degenerates, monstrosities, etc., while trying to formulate a fundamental principle, and turn our consideration to the naturally selected and more important species, such as the mastiff. Again, the occlusionist would refrain from even an attempt to reduce the snout of a mastiff to that of a pug dog. He would endeavor to restore the dental arches to those positions upon the bodies of the maxillary bones which to the best of his knowledge are normal for that particular species.

In conclusion permit me to urge that not only should the orthodontists agree upon occlusion as the word to designate the contact of the teeth of opposing arches, but that this contact should be the basis of all their efforts.

Discussion.

Dr. S. H. GUILFORD, Philadelphia, Pa. Dr. Summa and myself agree on a great many points and we disagree on others. He belongs to what is sometimes called the "new school" of orthodontia, and he generally places me among those of the "old school," perhaps not so much on account of my views as of my age. So when I am spoken of as belonging to the old school, I want it to be understood that some of my views are the same as those of the old school, and a great many are in accord with those of the new.

Dr. Summa makes a plea for the use of the word occlusion, and alludes to the fact that I spoke on this subject before this body a year ago. In the selection of terms in dentistry we have the same difficulty that is found in many other branches of the sciences and arts—the difficulty of getting the right word

to express exactly what it is intended to convey. In many cases the word does not exist, and we have either to formulate one or else to be satisfied with one that does not quite cover the ground. To illustrate this, dentists have always had difficulty in describing that portion of the tooth which lies beneath the gum. We have not a word to express it exactly. We once spoke of it as the fang, but the fang is outside, and not underneath the gum; then we spoke of it as the root, and while that is not strictly correct, it is the only word we have to express that idea. And this is so with many other words. For years we spoke of the "nerve" of a tooth, but we now call it the pulp. So also in regard to the matter of occlusion. We have had a number of words—a half-dozen or more—that do not exactly express the idea the term should imply. The word occlusion does not quite express it either, but we must agree upon something. For many years we spoke of it as "articulation" of the teeth, and we have an instrument called the articulator to aid us in arranging artificial teeth, which operation we call "articulating" the teeth. Now in a measure that will do, but articulation means a great many things. For instance, when I speak, I am articulating, and we have articulation of the bones forming a joint. Now, on the other hand, occlusion means to come together; it means the act of placing different things in contact, end to end. It does not relate to the movements of the jaw, but it means coming together, and so while occlusion does not accurately express the idea, it expresses it better than does articulation, and consequently we have agreed to use the word occlusion.

Another illustration. Many years ago dentists were in the habit of speaking of the palatal for the upper, and lingual for the lower inner surfaces of the teeth. This is correct, but we have eliminated one of the words, and we call the upper and lower surfaces lingual because the tongue touches both. We are coming gradually to a better understanding of nomenclature, by the elimination of words that do not serve the purpose or

intention. You know how common it is in everyday life, when we cannot find a word to express a condition or thing, to go to some foreign language for it. And the same thing applies with other languages in relation to our own. For instance the French people have no word for beefsteak, and so they call it "biftek." All do the same thing in regard to other languages.

One other point in Dr. Summa's paper I would like to speak of, and that is in regard to the classification of peculiar conditions. In many cases there is a peculiar abnormal condition of the jaw or in the arrangement of the teeth of an individual, and we notice the same peculiarity in the children of that individual. The essayist says he is not satisfied as to whether this is the result of heredity or environment. It is my opinion that it is not so much due to environment as to heredity, because certain other peculiarities which we see we cannot doubt have been due to heredity. I have in the course of practice seen two individuals each with one brown eye and one blue eye. They had inherited the characteristics of one eye from one parent and those of the other eye from the other parent. That was not environment but was direct transmission, and the same thing applies to other characteristics. But as the essayist also said, whatever the cause of malposed teeth, the duty of the orthodontist is to correct the abnormal condition.

He says a man never has too many teeth. There is no question of that, and in most cases it would be folly to lessen the number. I have taught, as have many others, that wherever it seems to be necessary to reduce the number of teeth, even by one, in the correction of an irregularity—such a course has to be considered in the very rarest cases—this procedure is simply a compromise between a difficult and a simple operation; a question of having a little good done, or not having any good done at all.

Dr. J. A. GORMAN, Asheville, N. C. One of the principal points Dr. Summa brought out in his paper was simplicity, which is the keynote of everything; it

is especially so in orthodontia, both in the matter of nomenclature as well as in that of appliances.

Another point he brought out which is of great importance is the necessity for a study of both arches in the correction of irregularities. How many dentists do you see who come to the conventions with one cast of a mouth in which there exists an irregularity, and want to know how to correct it! What can you tell from one cast? Nothing at all. And yet we have dentists who pretend to straighten teeth by looking at just the cast of one of the arches.

One portion of Dr. Summa's paper appealed to me particularly, namely, the one in which he says that "We must strive to place the teeth in the occlusal relation which is normal for that type of the *genus Homo*." This is something that we should always watch. So many dentists attempt to straighten teeth giving no thought or consideration to that requirement, and without consideration as to future results, frequently leaving the patient in a worse condition than before treatment was begun. Beauty is secondary to perfect occlusion; therefore, non-extraction—by all means! Normal does not mean "natural" as Dr. Guilford said, but typical or regular, and let us all apply occlusion as the basis of all our efforts.

Dr. J. W. PEETE, Memphis, Tenn. Just one point in relation to heredity and environment—one question I would like to ask. If it is not environment instead of heredity that causes these peculiar conditions, why is it that these malformations of family types are in the permanent set only? We rarely see a deformity of the deciduous teeth, and it is perfectly natural that the deciduous teeth should be affected more than the permanent if it is due to heredity. I believe it is more due to environment in every case. Heredity may have a trifling influence, but I believe these malformations mainly due to environment.

Dr. G. V. I. BROWN, Milwaukee, Wis. I was very much interested in the fact that the essayist made the point—the chief one, as I understand it—of bat-

ting for a distinct term that would always represent the same idea. As to whether occlusion is exactly the word or not is a matter of opinion, but I believe it to be the proper term. The fact that we ought to have as nearly as possible a distinct term is beyond question. I am obliged to take issue somewhat with the essayist in regard to his saying that he was not dealing with freaks, and then going on with his paper. Of course, when you are dealing with orthodontia cases you are for the most part dealing with freaks to a greater or less degree.

As to the question of etiology, it seems to me that it should be elaborated upon in this discussion, and particularly in view of the point raised by the last speaker, that generally the deciduous teeth in the mouths of young children are at least to a very considerable degree regular, and he gathers from this fact that the tendency to irregularity increases as the individual grows older, and that it must therefore necessarily be a question purely of environment. Now that does not follow at all, and in order to know why it does not, one should go back to the study of embryonic sections.

Those who have thought of the subject know that this question is decided in a large degree during the very early periods of tooth-life. We know that during the fifth or sixth week the germs of the deciduous teeth are all well under way. The follicle has begun to be formed, and can readily be shown by microscopic sections, and later on there is a budding off from it that becomes the follicle of the permanent set. Anyone can readily understand that even at that early period anything that might disarrange or disturb this cell development will interfere with its normal development. We agree with the essayist that there are certain characteristics which are apparent in these tissues. The tendency to irregular cell development applies not only to the developing teeth, but equally as well to other organs and portions of the body in course of development at that time; and consequently we have come to recognize certain types of dental irregularity

as being characteristic of certain types of people.

Again, taking up the question of environment—this force not only disarranges the occlusion, but interferes with muscular action, and other muscles besides the muscles concerned in occlusion have much to do with the question of irregularity. In speaking of heredity I do not mean to attribute to it that which we recognize as due to environment. I recognize fully that any attempt at correction of this trouble without taking into account correction of these muscular forces will be useless, but I do not like to hear a statement made which places the entire responsibility upon one single factor, for it is apparent that it may rest in any case, according to the individual, upon either or both. As an example I want to speak of greater deformities. I have been keeping a record of cases of hare-lip and cleft palate, and find that the deformity in many instances in a particular family will skip a generation. This happens so often that one cannot question that heredity is a factor. If I once find in the clinical history of that family that there has been paralysis, tubercular tendency, or neurosis, the offspring from such individuals must be people in whom irregular cell development has occurred.

Dr. GEORGE E. HUNT, Indianapolis, Ind. Today, as ever, I approach the ground of the orthodontist with fear and trembling, because I know nothing about it, and I have a high respect for his knowledge of the subject; but rather than speaking of the patients of the orthodontist as freaks, I confess that I am often inclined to apply that term to the operator.

There is, however, one thing I want to speak of, and that is heredity. I was raised on Darwinism to a degree, and I still agree with him. The argument advanced this afternoon in regard to the regularity of the deciduous teeth as disproving the influence of heredity will perhaps lose force if we consider the conditions in the arches when the deciduous teeth are being erupted. These do not fill the arch as do the permanent ones.

As the child grows there is an expansion of the arch, and at the same time the germs of the teeth are assuming their proper position in relation to the position that they will later assume in the matured jaw. It seems to me that the orthodontists ever since they have advanced the theory that because the deciduous teeth are regular, irregularities of the permanent teeth are due to environment, have failed to take into consideration the rapid growth of the jaws and the pressure of the tongue and cheeks in bringing the deciduous teeth into position. We have all seen deciduous canines erupting in an irregular position, but later assuming their proper positions through the growth of the arches and the pressure of the tongue and cheeks. And I believe that we have evidences in other organs as well as in the teeth that these characteristics are due to heredity.

Dr. SUMMA (closing the discussion). I am grateful for the liberal discussion given this brief and somewhat unfinished paper. Its brevity is due to a request of the chairman; and while I also like short papers, I feel that one cannot do justice to a subject in too brief an essay.

Now, in the difficulty of agreeing upon a nomenclature, we resemble the followers of other branches of the sciences and arts. The great biologists have not been able to agree upon a nomenclature for the question of heredity, and if we study this we find that it all comes down to one theme, *i.e.* that there must be transmitted from the parent to the offspring vital units. These vital units have been named differently by different authors. One calls them *gemmules*, another *pangens*, another *biophores*, and still another *micellæ*; yet they are all one and the same thing—vital units. I assure you that the study of this question would also be simplified if biologists could be as harmonious in accepting one term as dentists have been in the acceptance of the term occlusion. I tried to be more explicit in a paper I presented at the last meeting of the American Society of Orthodontists, as regards the question of heredity, the transmission of acquired

characteristics, and the effect of environment upon the position of the teeth. The best that I know at present is that every organ owes its *existence* to a transmitted germ, but it owes its *final form* to that transmitted germ plus the influence of external agencies. During the period of eruption of the deciduous teeth the external influences are less in power, but as the child lives on, it is subject to disease and other influences which impress themselves upon all growth, consequently we find a great tendency to malocclusion in the permanent set.

As to acquired characteristics dealt with in the problem of heredity, we ought first to decide what acquired characteristics are, and then we might, at least in a limited way, decide between transmissible and non-transmissible acquired characteristics; at this time I am only prepared to say that mutilations are non-transmissible. One could argue for hours along this line. There are those who argue that malposed teeth are due to environment, and then again there are those who argue that malposed teeth are due to heredity. I believe that some are due to environment, and others due to heredity, and it will be a problem for the orthodontists to distinguish between these two. We cannot expect to decide this except in a few cases. I believe that the tooth is the initiative for the existence of the calcified jaw, and the development and growth of the teeth mold the jaw under favorable conditions into a normal jaw, but under adverse conditions, into a badly formed jaw. The chief factors concerned in the development of the jaws are the growth of the teeth within them and the external influences, *i.e.* tension of the muscles of the cheeks, lips, and tongue, and the difference of atmospheric pressure from within and from without the oral cavity.

Dr. Guilford spoke of the "old school" orthodontists. There is not so much difference between the old and the "new school" of orthodontists, if we cast aside personal interests. Dr. Guilford and I agreed on more points than many expected. It is a matter of casting aside personal feeling to work out fundamental

principles, and the slight difference of appliances can be readily remedied.

In closing I wish to thank both the society and the discussers for their kind attitude.

The next order of business as announced by the President was the reading of a paper by Dr. GEORGE H. WILSON, Cleveland, Ohio, on "Phases of Art in Prosthesis," as follows:

PHASES OF ART IN PROSTHESIS.

Twenty years ago there was much discussion about dentistry being a specialty of medicine; today we are more concerned about the specialties of dentistry. There are several distinct departments of the science and art of dentistry that are being more or less specialized. The more prominent ones are operative, prosthetic, orthodontic, prophylactic, surgical, and mechanical. There is no well-defined natural line of demarkation between these specialties—each overlaps the other; however, arbitrary lines are being drawn. It is only necessary in this paper to define what we understand as the province of the department of prosthesis. Therefore we define prosthesis as the science, art, and esthetics of restoring a lost dental organ or organs and their associate parts with an artificial substitute. Science is the classified knowledge pertaining to the specialty; art is the skillful doing of the work; and esthetics is the harmonizing of the instrument with its environments.

This definition states, as the minimum field, a lost dental organ. Here is where an arbitrary line dividing the two departments, operative and prosthetic, is necessary. The prosthetist considers when so much of the natural tooth is lost as to necessitate the substitution of an artificial crown that the case belongs to his department; while the operator could justly claim the case so long as a restoration can be attached to the root. By the definition, a bridge undoubtedly belongs to the prosthetist, but a bridge cannot be attached without a crown, some modification of a crown, or some form of attach-

ment that belongs to operative dentistry. Hence it is apparent that the line must be drawn with the crown of the tooth, giving the case to the prosthetist as soon as a full artificial crown is required. The setting of an artificial ready-made crown does not logically belong to prosthesis, and ought not to be considered as belonging to the operator. If the entire profession were divided into the two specialties—operative and prosthetic—and the line of demarkation as laid down were rigidly adhered to, there is no question but that more natural crowns of the teeth would be saved than if artificial crowns of some or all forms were considered as operative work. The treating and preparing of roots and teeth for crowns and bridges is really operative work, but it will usually be for the best interests of both patient and dentist if the prosthetist prepares the abutments for the superstructure he is to build. Assuming that the minimum field of the prosthetist is the construction of a crown, and that he may be required to supply appliances for lost lips, noses, cleft palates, excised mandibles and maxillæ, and fractured jaws, his usual field of service consists in restoring masticating surfaces and the contour and harmony of the lower third of the face.

Society recognizes two kinds of art—utilitarian and esthetic. Someone has said that the difficulties of prosthetic restoration increase with the amount of lost tissue to be restored. As time is limited, we will consider in this paper only the restorations for well-resorbed edentulous jaws. We desire to discuss certain phases, both utilitarian and esthetic, of restoration, without discussing materials.

When the teeth are extracted certain physiological changes take place, which are usually quite complete in from one to two years. These changes consist of a resorption of a large portion of the alveolar processes and their integuments. Nature has designed, although in ninety-five per cent. of cases the upper teeth overlap the lower, that the dental curve of the lower teeth to be greater than that of the upper, and the long axis of the teeth a slight incline, with the end at the

apices of the lower teeth farthest from the center. It naturally follows that the relative positions of the curve of the summits of the alveoli are much changed as resorption takes place. As the alveoli of the maxilla recede upward and inward, the summit curve must diminish; and as the alveoli of the mandible recede downward and outward, the summit curve must expand; hence the anatomical relation of the summit curves has been entirely destroyed, and it has thus added greatly to the difficulties of a utilitarian restoration of the lost organs. Besides the changed relation of the fulcrum for the restorative appliance, the features have been distorted by the settling of the origin of five pairs of muscles of expression.

The depressor *alæ nasi* and compressor *nasi* both arise in the upper incisive fossa, and are inserted respectively into the septum and wing of the nose. By the process of resorption, either these muscles are stretched or the tip and wing of the nose are depressed. It is obvious that any attempt at padding out these muscles with an artificial appliance will only exaggerate the deformity.

The levator *anguli oris* arises in the upper cuspid fossa, and is inserted in the angle of the mouth. The resorption of the process does not put this muscle upon a strain, yet it is necessary in the artificial denture to notch out its periphery and buccal surface, just back of the cuspid eminence, or the muscle will be very much distorted and the patient will have the appearance suggestive of a constant snarl.

The levator *menti* arises from the lower incisive fossa, and protrudes or rolls the lip outward; thus when resorption has taken place, and a restorative appliance is inserted, no strain should be placed upon this muscle.

The depressor *alæ nasi*, compressor *nasi*, and levator *menti* explain why the periphery of the upper and lower dentures must slant from the cuspid eminences to the median line.

The buccinator arises from the buccal surface of the alveolar process of the maxilla, and is inserted in the buccal sur-

face of the alveolar process of the mandible. As both the origin and insertion of this muscle have receded, it is apparent that a restoration to the original contour of the tissue is impossible. Also it must be remembered that this muscle is not only a muscle of expression, but of mastication, and that too great an attempt at restoration will interfere with the retention of the denture.

When we consider that an upper denture is held in position by adhesion through contact, and possibly temporarily by atmospheric pressure—and in addition to this, the exaggerated relation of the summit curves, also the action of the buccinator muscles—then it can be easily comprehended why the physical laws of leverage are such an important factor in dental restoration.

If these statements are facts, then it is a logical deduction that it is a physical impossibility to make a perfect anatomical restoration. It is also a justifiable conclusion that the insertion of an artificial denture is no mean or trivial operation; that it requires the knowledge of a scientist, the skill of an artificer, and the judgment of an experienced esthetist.

Does it seem an imposition upon a trusting public for a careless operator who despises "plate work," with the aid of a mechanical laboratory to insert artificial dentures? Undoubtedly the patient will be better served because of the mechanical laboratory, even though it be a thousand miles away, than if the indifferent operator had made the "job." It is true there are operators with the esthetic sense so well developed that, with the aid of a mechanical man, they will better serve the patient than the average prosthetist, and possibly better than any prosthetic specialist. If this should be the case, it is because of the different caliber of the operator and the specialist. No argument is necessary to prove the assertion that any man, no matter how brilliant, will nearer reach perfection by confining his talents to a narrow line of work than by dividing his time and energies between several specialties that are only indirectly associated. It does not follow because a man is devoting his entire

time to a special line of work, that he is enriching the field of that specialty, for there are comparatively few minds capable of originating and executing new ideas. Some one has said, "One truth discovered is immortal, and entitles its author to be so; for like a new substance in nature, it cannot be destroyed." Most of us follow, and do well to perfect ourselves in that effort. However, it is reasonable to suppose that any man will do better work if he confines himself to a limited field than if he tries to do many things.

Recognizing the changes that have taken place in both the hard and soft tissues, two things are required of the prosthetist: to restore the ability to masticate—and to beautify. The first of these is not within the province of this paper; and we regret our limitations in dealing with the other. However, we make our offering, trusting it may help some, and prompt others to carry the subject to its fruition.

Before we proceed we must define the two words, "normal" and "natural." Last year in his paper on "The Nomenclature of Orthodontia" (DENTAL COSMOS, vol. xlviii, p. 135) Dr. Guilford stated: "*Normal* does not mean natural, as one would often infer from its common use. Its definition is 'conforming to a type or standard.' Its synonyms are 'regular' and 'typical.'" *Natural* is pertaining to nature, as produced by nature. Thus we say the alignment of the teeth and profile of the face are natural, because they are as produced by nature; but they may or may not be normal. If they do not come to the line of harmony, they are not normal. If there is perfect harmony, then there is perfect beauty of form, dependent upon the beauty of the type.

We assume that the Creator designed that every soul should inhabit a perfect body. According to its type it should be like the Greek creation Apollo, every line and every inch godlike in its perfection. Had the original design prevailed, there could have been no beauty associated with the human form, because there would have been but one type, and each individual would have been a duplicate of all

others. Beauty is appreciated by contrast only. The Creator also gave the laws of environment. Therefore we have no two persons that are exact duplicates of each other. As the body is molded and shaped by external mental and physical influences through conception and gestation, and by both external and internal mental and physical influences through infancy, youth, adult, and senility, there can be no perfect duplicate or absolute conformity to a given standard; and yet how wonderfully alike are human beings!

Ethnologists, physiognomists, and other scientists have divided and subdivided the human family into many classes for the purpose of better studying man. So far as prosthetists are concerned, our studies have been confined almost entirely to the Caucasian race, and we consider only such classification as will aid us in understanding the needs of our profession. We first divide the race into two classes—light (blond) and dark (brunette)—a simple classification easily understood and which calls attention to certain facts. The next classification is into "temperaments," dividing the race into four or five classes, according to the classification chosen. These divisions with their various combinations will carry us much farther into the physiological study of our patients; will establish types, and teach us to note the variations in each subject from the type.

Another classification we may call the "dental profile" classification. Scientists consider this subject as a study of the facial angle, and make two general divisions—orthognathous and prognathous. This division is of little value to the dentist, yet the study of the profile is perhaps the most important of all the classifications for the prosthetists.

For convenience of study we divide the dental profile into three classes—*straight* profile, *convex* profile, and *concave* profile.

Scientists, in drawing the perpendicular line of the face, have it touch the most prominent point in the median line of the forehead and the most advanced portion of the maxillæ.

The dental profile line is somewhat different from the perpendicular facial angle line.

The first class, or straight profile, is the ideal Greek face. The perpendicular line has three points of contact—the frontal and mental eminences, and the middle of the wing of the nose. The lower lip will just touch the perpendicular line, and the upper lip will be a little in advance of the line. There is no question that this is the normal profile of the highest ideal of beauty.

The second class, or convex profile, has two points of contact with the perpendicular line—the frontal eminence and a point at the base of the nose that is the same distance from the middle of the back of the ear as the frontal eminence. In the type this point will be the center of the wing of the nose.

The ideal standard of this class has the face made up of rounded, graceful curves; forehead high and slightly receding; nose Greek or Roman type; lips full but not coarse; chin receding but not weak; teeth, both number and alignment normal. No competent orthodontist would think of converting this ideal of our second class into the first or straight class, for he would recognize that the harmony of the features would be destroyed.

The third class, or concave profile, has the frontal and mental eminences in contact with the perpendicular line. It is not possible to conceive of this profile being a mark of beauty, and it is fortunate that the class is small compared with the other two. It is a condition confronting the prosthetist, and he must place the features in as pleasing a relation to the concave curved line of the individual as possible.

The physiognomy of man is gradually changing and tending toward new types. The intermarriage of different nationalities and the modes of living, causing mental development and physical degeneracy, partly account for this condition. For the last few years the orthodontists have been impressing upon our attention the importance of teeth in the physiognomy of man, and giving us a rational

reason for many of the abnormal conditions. This same study is of value to the prosthetist, as it aids him to understand the designs of nature for the individual case, and aids him also in classification. In studying the harmonies and inharmonies of the face, it is important that we consider the causes as well as the effects.

These few thoughts upon the profile have been given to impress the importance of the subject, and to show that it is a rich field for original work.

When the prosthetist has studied the individual case and classified it, he is confronted with the question: What is one's duty, to restore the features to the natural or to the normal condition? It is apparent that a normal convex profile should not, in a portion of its outline, be converted into the concave type, and thus form an ogee monstrosity. Each individual case must be kept within its normal class, and then it is a matter of judgment for the prosthetist and patient to decide how much the natural peculiarities shall be modified.

It should be borne in mind that physiognomists make a distinction between the anatomy and the expression. Expression is of the soul, by or through the anatomy. Therefore deformities of the anatomy may belie the soul. The prosthetist should study well to have the teeth of the proper size, color, form, and arrangement to harmonize with the rest of the anatomy of the face. The esthetics of prosthesis may be expressed thus—"anatomical harmony" and "pleasing in expression."

The next phase we shall consider is the prosthetist himself. For information upon the subject we sent a letter containing the following questions to seventy-one college teachers, and later to eight men referred to us as specialists:

Are you teaching Prosthesis? What school? Do you practice prosthesis as a specialty? Do you operate, or do any other line of dental work? Do you do laboratory work for other dentists? Do other dentists send their patients to you for prosthetic work?

Please give me the name and residence city of all dentists whom you know to be con-

fining themselves to prosthesis as a specialty. I do not want parlor men, or commercial laboratory men who work for dentists only. I do not desire the name of any man unless he is a legal practitioner, and works at least part of the time for patients.

From the replies received we give the following summary: The number of men devoting their entire time to the prosthetic specialty is 11. Of these 4 are teaching prosthesis but not conducting a practice; and 1 is devoting his entire time to crown and bridge work and teaching. All others, though much interested in prosthesis, are conducting a general practice.

Who should take up the specialty of prosthesis? Those men who have been a few years in general practice, and have acquired a love for and a reputation in this line of work. No man is justified in giving up his general practice unless he is certain his dental *confrères* will support his efforts by referring their patients to him. The prosthetist must bear in mind that it will be the case—as it should be—that the patients, as a rule, will first go to an operator.

It is the opinion of the essayist that it is impossible to build a living practice as a prosthetist without the assistance of the operators.

The field is great, and there is room for a large number of skilful prosthetists if the dentists will support the latter rather than the cheap laboratories. With a body of men devoting their lives to the science, art, and esthetics of this specialty, we could expect great advancement within a few years.

Discussion.

Dr. C. J. GRIEVES, Baltimore, Md. I received Dr. Wilson's paper some time ago, and having studied it carefully, I must say that I am much impressed with his effort to give us definite mathematical lines by which we could produce art. I do not say that this is possible, but I do say we should try along those lines, and should thank Dr. Wilson for his efforts. I cannot agree with him in the contention that dentistry should be further di-

vided into specialties. Orthodontia lends itself very completely, in my estimation, to assignment as a specialty, and for reasons we all know. Dr. Wilson has defined the prosthetist as a man who does everything in dentistry except the filling of teeth, the simple treatment of the soft tissues when such treatment is necessary, and that of the pulp-canal with its contents for the preservation of a tooth. All else, he says, is prosthesis, and operative dentistry is to be confined to some such limited field. Later on he tells us that the patient would naturally go first to the operator. I thoroughly agree with him, and believe it would be a great misfortune to divorce the laboratory—the old-fashioned laboratory—from the dental office. Historically we came near abandoning it at one time, when, on the introduction of vulcanite, the operator looked down upon the man who did rubber work, and the mechanic despised the man who would not soil his hands. Then came crown and bridge work into the breach, as, in my estimation, the greatest savior of scientific mechanical dentistry, bringing the laboratory nearer to the operating room, where it justly deserves to be.

So much of what Dr. Wilson calls prosthesis—beginning with the treatment of the root and the placing of the artificial crown, clear on through bridge work, dentures, vels, splints, and what not—is really operative dentistry, that it has for a long time been my belief that instead of separating prosthesis from the operative chair, prosthesis should be brought to the chair—that is, more operative methods should be applied to the production of prosthetic appliances. I should consider it a great misfortune if dentistry were to be further subdivided, thus widening the chasm between prosthesis and operative dentistry. It is largely a matter of juggling with terms. The simple question is, whether the public will be better served, and the dentist made happier by such a subdivision, or whether both will not save time and be more contented if this work be done by one man; that is the point to be consid-

ered. For instance no two men could possibly reach the same conclusion as to the exact time when the mouth is fit for the placing of a denture. On the contrary, if one man carries out all of the different steps in the operation, he may follow different methods from those of the specialist, but to my mind he will get just as good results. In the matter of excluding occlusion from the field of art in prosthesis, I think the essayist is decidedly paradoxical. No matter what the art may be made to embrace, it would not be possible to exclude occlusion from the process of making a denture.

Dr. Wilson has defined the muscles of expression, and has described their insertions. It is a rule in anatomy that if a muscle has one insertion it has another. These muscles have another insertion, and that is found in the orbicularis, and the orbicularis being a sphincter may be said to have a movable insertion in its contact with the teeth and the alveolus. Therefore, when the teeth are lost, contraction of all this mass of muscles including the orbicularis will follow; coupled with such contraction a shrinkage of the alveolus will take place. The alveolus is a transitory structure which, particularly after certain diseases, as pyorrhea, goes on wasting definitely. Thus we may have in mind for some such case Dr. Wilson's ideal convex facial line, and have to be satisfied with a concave profile eventually. All we can do is to produce utility combined with art. It would be the highest ideal, if we could bring our practice up to the standard set by Dr. Wilson, and I hope we may. If we can but learn and teach the art of prosthesis so that every man practicing it (and most of the gentlemen whom I see before me are practicing it), particularly those in the country and in the smaller towns, where it would be impossible to have prosthetic specialists, may do the best that is possible, esthetically, under the circumstances, after giving the occlusal lines and the arch and ridge due consideration, I think it is all that is needed and is that which we should be doing now.

Dr. C. L. ALEXANDER, Charlotte, N. C. With regard to that portion of the paper in which the essayist refers to the line of demarkation between the prosthetic and the operative dentist, I think it would be very difficult to get both branches into closer relationship than he has described. While I do not agree with the essayist at all as to the matter of specializing, I wish every man practicing prosthesis could read his paper. If we had a better knowledge of the oral cavity and its associate parts before and after resorption, I am sure it would enable us to do more artistic and useful work, and to arrive nearer the ideal which every man must have in his mind as to how work should be done.

I am sorry Dr. Wilson did not describe some of his methods of arriving at results, because it would have helped us more than anything else. Theory is all right in its place, but without practical results it is a failure.

I will endeavor to describe one method that I have adopted in the making of artificial structures—say a full denture. After preparing the cast, I produce in modeling compound forms of such a shape as to represent the plate, teeth and all, just as we want them to appear in the mouth. By doing this, and putting the forms to place in the mouth, we can see where restoration is necessary, being careful to trim the forms to allow for all lingual and muscular movements. In this way we obtain casts which may serve as guides in the construction of the permanent dentures. Those of you who have not tried this method will find it a great help in arriving at satisfactory results.

Dr. B. J. CIGRAND, Chicago, Ill. I am very much interested in this paper. It covers so much ground that I am at a loss to know where to begin or where to leave off. Dr. Wilson has gone over so much matter that I feel that I must congratulate him for the labor involved in the preparation of the paper. Anyone who attempts to give us anything new in what appears to us a foreign territory must, of necessity, give much of his time and considerable attention to the subject.

I am rather inclined to think that the essayist is going too far when he advocates so much specialization in dentistry. I do not believe in the subdivision of dentistry into too many specialties, viz, porcelain work, operative work, prosthetic work, and what is advocated by some—the subdivision of prosthetic work. I think we are subdividing too much, and I believe in this subdivision there is loss, because we lose the spirit of the general, and when we lose that we lose much of the substructure. I think the profession is sufficiently subdivided now for us to keep in touch with everything that we love. My profession is dear to me, and I do not like to hear of its subdivision if it can be avoided. I like operative work, porcelain work, and crown and bridge work, and I do not believe it is a good idea to advocate the subdivision of a subdivision; not that I think that what we say here today will be done tomorrow, but it may be done sometime. There is sufficient work for us to do in other lines, and if we can perfect the nomenclature of our profession, we will be building a straight line to a given point. There are too many words that mean the same thing. I would like to see our nomenclature simplified, so that when a statement is made, its real significance will be understood.

That dentistry is thoroughly and absolutely wedded to art is an emphatic truth; art in every phase of the word—in color, shape, shade, and build. There is in every phase of art something that appeals to us as dentists. When we walk out on the streets of this beautiful city of Atlanta, and see the great architectural structures, there is something which appeals to the dentist. When we go out into the realms of the railroads and see the immense bridges that span the streams, we find something there that appeals to us artistically. Everything in art is more or less part and parcel of what we as dentists are working for. We should not relegate too much to specialization, but keep close to the general practice, as it broadens the mind and certainly educates the hands. We should

identify ourselves with other associations, meet in other conventions, and subscribe to other journals, in order to keep in touch with those who are laboring for the same thing as are we—to make more beautiful and preserve that which God has given us.

This subject is broad, and so far-reaching that I will not attempt to go into it farther than to say that I am glad to have been called upon to discuss this excellent paper, since it is in thorough keeping with the art impulses of our calling.

Dr. WILSON (closing the discussion). I was very glad to hear the differences of opinion expressed, because that is the means by which we learn. If all agreed with me, then I should feel that I had not made any impression upon you.

Dr. Grieves somewhat misunderstands my position in regard to specialties. I do not for a moment advise any man to take up a specialty until it is taught in the colleges. When a man becomes interested in a particular line of work more than in any other, there is no question that if he confines himself to that line of work exclusively he will progress faster than before. It is also true that specialists are liable to become narrow in their views. Our whole profession narrows a man, and when it comes to a smaller part of the profession, it tends to make a man still more narrow. The question arises here as to whether we are working for the profession, or whether we are working for our selfish selves. If we intend to work more for self than for the development of the profession to which we belong, we should never go into

any profession, because we will not do it any good; but if we are working for our profession and will specialize, we will probably do more for it than otherwise, provided we have the qualifications for that profession.

Consequently I say that Dr. Grieves misunderstood the meaning of my statement on specialties in the profession, and when he claims that I would have the prosthetist take in all of dentistry except a minor part of the operative man's work—that is, preparing cavities, inserting fillings, etc.—he likewise misunderstood my statements. There is a great deal more in the operative field than those operations. We have materia medica and therapeutics, and these subjects should be a great field for the operator. Of course he must put in fillings, as a part of the treatment, but there is a great deal in the therapeutics and pathology of dentistry. I would not for a moment have the prosthetist trespass in the field of the operator. His business is to take the mouth after the dental organs are lost, and not to attend to the operative phases of the work, because he is not prepared for it. And likewise the man who practices operative work and restores the teeth to their original usefulness should not enter the field of the prosthetist, because he is not prepared to undertake this phase of dentistry. I believe that as a profession we can advance still more by having certain men take up certain lines and follow them out. And I hope that the ideas I have advanced along this line will receive consideration and will do some good.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1906.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 20, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city. The president, Dr. Van Woert, occupied the chair and called the meeting to order.

The special paper of the evening was read by Dr. FREDERICK C. KEMPLE, his subject being, "Orthodontia as a Prophylactic Measure."

[This paper is printed in full at page 337 of the present issue of the COSMOS.]

Discussion.

Dr. M. L. RHEIN. I had the pleasure of reading a copy of the essayist's paper some days ago, and have had some little opportunity for studying it, and I believe this society is very much to be congratulated in having this paper presented to it. It is barely possible that in the reading of an essay of this kind, or in listening to it for the first time, its full significance may be somewhat lost—not that anything startlingly new has been presented by the essayist, as the facts that we have listened to ought to be familiar to all of us—they seem to be incontrovertible—but the one fact remains that prior to this occasion the subject has never to my knowledge been publicly presented to the profession. The importance of prophylactic treatment of the mouth has been made very emphatic for a great many years past, and, to speak broadly, the disciples of prophylaxis of the mouth have been unquestionably growing in number year by year.

Now, what has the essayist presented to us in regard to this fact? We are pretty generally agreed on what he has laid down, viz, that if you keep the mouth in an absolutely clean condition,

you will keep that mouth in a physiological condition; you will keep it free not only from the invasion of caries, but also free from other diseases that attack the dental organs sooner or later and with more or less emphasis. This question of keeping the mouth clean seems very easy at first sight, especially to the layman when it is presented to him, but we know what a difficult matter it really is. In my attention to this subject, I have become acquainted with the fact that dentists have very different views as to what a clean mouth is. To say that it is kept in a sterile, hygienic state admits of very different ideas, according to the dentist who makes the statement. It has been a not infrequent matter to have patients look with astonishment at me when I have said to them, "The first thing that is necessary in your case is to keep your mouth in a sterile condition—clean absolutely," and to have them inform me that it had been but a short time since the mouth was cleaned, and they do not think they ever had it in a cleaner condition.

The point that I wish to emphasize in conjunction with this fact is the following: It is scarcely possible to keep a mouth clean many days or many hours without operative interference on the part of the dentist. In other words, accretions that first deposit themselves upon the enamel surface are microscopic in character. They are of such a nature that they are imperceptible to the eye. This has been very beautifully illustrated by some of Professor Miller's latest work. Now, when these accretions have increased in thickness to a very considerable extent, they become unrecognizable to a great many dentists because of their similarity in color to the tooth-substance, bathed as they are in the oral fluids. It

is not uncommon for me when I am instructing a student in the method of mouth-cleansing, to show him a large amount of accretion left upon the tooth-surface that he has absolutely failed to perceive. The adjustment of the rubber dam to such a tooth and drying of the surface is frequently sufficient to open the eyes of the student to the fact that he has not been able to distinguish this accretion on the enamel surface.

The essay of the evening is replete with merit, and I have looked through it from beginning to end with the deliberate object of endeavoring to find some point of attack upon the essayist, and from my standpoint it is invulnerable in this direction. It is not my object to discuss methods of prophylaxis, nor prophylaxis in its advantages to the preservation of teeth. I am taking it for granted that this is an admitted fact, and I believe it is so by the majority of the profession at the present day, although I do occasionally see some patients who look aghast when I suggest a treatment of this kind every four weeks, or sometimes every three weeks. They remark that the last dentist always told them that such a course would invariably result in the ultimate destruction of the enamel. I think the number of men in the profession today who make those statements is constantly becoming smaller and smaller, so I do not propose to go into the merits or demerits of prophylaxis; but the point is that if every mouth were a normal physiological mouth, or as nearly such as possible, dental prophylaxis as it is understood would become a very simple matter, and operative dentistry would likewise become a comparatively easy thing for all of us.

But we find mouths in which there is more or less malocclusion, where the alignment is wrong and other irregularities of the arch exist that harass the life of the operator, and where additional operations have to be done, and as a result each operation becomes in turn almost an individual invention. This applies as much to operative dentistry as it does to the dentist who is attempting to practice prophylactic dentistry, be-

cause it makes it necessary for such a mouth to be treated much more frequently than if it were in a normal, physiological state, for the reason which the essayist has demonstrated—the difficulty the patient himself finds in keeping such a mouth clean.

I want to indorse very strongly the criticism which the essayist made in regard to a statement of Dr. D. D. Smith's, that in this age of civilization mastication and the use of the normal teeth were unnecessary for the maintenance of life in its normal form. Since this remarkable statement of Dr. Smith's—I believe it was in 1902 or 1903 at Washington—I have looked in vain to find one man, either in medicine or dentistry, who has lent his support to such a peculiar and astonishing statement, and I am very glad that the essayist has taken up this matter and condemned it in such strong terms. I want to add my quota of adherence to what he has said as to the theory that the entire head is benefited from the use of the jaws in mastication, and in order that they should functionate properly, it is important that the teeth should not be in an irregular position. The experiments that he has noted, conducted by Professor Fisher in elaborating what is known as the "Fletcher idea" are certainly most corroborative of this doctrine, and, drawing aside a moment from the purport of the paper, I will say that every dentist in the world should do his utmost in educating the mothers of the community in the value of complete mastication and insalivation of every particle of food that is taken into the mouth.

This has been a matter upon which I have felt strongly from the first day I entered the practice of dentistry. There is nothing new in it; the teachings of physiology thirty years ago were as strong and clear and patent on this point as they are today, and nothing has been discovered in all this time that has changed our views on this subject. I presented the essayist with a few slides of my own for him to show in corroboration of some of the points he has made, but he very modestly preferred that I show them myself. The point I want to

illustrate first is this: The last slide that the essayist showed us of a normal physiological articulation and occlusion is an object lesson on this point.

If you read carefully the essayist's paper, you will see that he does not speak of irregular teeth producing pyorrhea, but he speaks of the condition as having a strong influence in that direction. Everybody that has studied the conditions of pyorrhea realizes that any form of irregularity at all is a strong contributory force toward pyorrhea. Wherever there is malocclusion, lack of articulation, improper spacing, or crowded arches—those are the points which if found in a case of malnutrition indicate that pyorrhea is going to be most marked, and frequently they are found where pyorrhea is apparent for the first time.

[Dr. Rhein then exhibited by means of the projecting lantern a number of slides of cases bearing on the subject under discussion.]

There is today as strong an objection to a radical handling of irregularities of the teeth at a young age, as there was a number of years ago to the question of the value of prophylaxis, and the point that has been brought out so far this evening is to demonstrate what a boon it will be to future humanity if the dentist will use his utmost endeavors with the parents of the children—when there is a question of some form of irregularity—to have their mouths put in a normal physiological state at as early an age as possible. The public, however, is not altogether ready for this. I have seen this duty very plainly for a great many years, and in trying to follow it I have lost more patients than from anything else that has occurred in my practice. When I say I have lost patients, I mean that when I have pointed out to the parent that it was absolutely necessary that the child's teeth should be regulated for the welfare of the future of that child, I have again and again lost the family as patients, because I refused to attend to the child unless this was done. Generally they consulted other dentists, and would then come back and say, "I have gone to Dr. So-and-so, and he said that

if that were his daughter, he would leave it to nature." I have simply said to those parents, "I disagree with Dr. So-and-so, and you must make up your mind whose advice you are going to follow, because if you are not going to follow mine, you cannot remain my patients." It is for that reason that I made the statement that I had never seen the thing presented as the essayist has presented it tonight, and in my opinion he has expressed it absolutely correctly, and I do not see how any legitimate criticism of his standpoint can be taken.

President VAN WOERT. We have with us a gentleman who, while he is not a member of the society, has come among us in Brooklyn, and makes a specialty of this subject. We should be glad to hear from Dr. Gough.

Dr. GOUGH. I consider the important point, as has already been brought out by Dr. Rhein, is the strong argument in favor of early interference in cases of malocclusion, and there are plenty of other reasons why there should be interference and treatment at an early age. This, it seems to me, is only one of them, but its importance has not heretofore been sufficiently emphasized.

Dr. HILLYER. I would like to set myself right. As I understand it, any dental practitioner takes first the precaution to see that the teeth are in perfect order. Do I understand that an orthodontist eliminates that entirely from his practice? If a patient consults such a specialist does he place that patient in other hands to be put in absolutely hygienic condition, or is it his practice, as I have always understood it was, to see personally that the mouth is put in proper condition before the operation?

Dr. KEMPLE (closing the discussion). Dr. Hillyer inquired concerning the prophylactic care that the teeth receive during treatment. If a patient whose mouth was much in need of thorough prophylactic care should apply to the orthodontist for treatment, the orthodontist would probably refer the patient to the dentist to have the mouth put in as sanitary a condition as possible before placing appliances on the teeth. During treatment

a constant watch would be kept on the teeth to see that they did not suffer through lack of cleanliness; the patient would be urged to keep the teeth carefully but thoroughly brushed, and at each visit any necessary cleansing would be done. Before placing a band on a tooth every surface of the tooth should be polished with pumice, then thoroughly dried and a thin cement coated over the

tooth as well as being placed inside the band. Observing these precautions there is little possibility of the teeth receiving injury from the appliances used.

Dr. GOULD moved a hearty vote of thanks to Dr. Kempe for presenting this subject, which was carried.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, February 1906.

THE First District Dental Society of the State of New York held a regular monthly meeting, Tuesday evening, February 13, 1906, at the Academy of Medicine, No. 17 West Forty-third street, the president, Dr. Arthur L. Swift, in the chair.

INCIDENTS OF OFFICE PRACTICE.

The PRESIDENT. Dr. John H. Meyer has two cases which he wishes to bring before us. We will be glad to hear from him at this time.

Dr. Meyer read the report of a case of fracture of the maxilla which he had treated, as follows:

John H. Reilly, clerk, twenty-seven years of age, was admitted to the New York Hospital October 9, 1905, suffering from a compound fracture of the mandible, the point of fracture being approximately between the left side of the first and second molars. Two bicusps and two molars were missing on one side of the fracture, and one bicuspid and two molars on the opposite side. There were no occluding teeth in the maxilla on either side. An external abscess had developed, and the swelling of the face was so great as to close the left eye. The temperature was 104°. An opening was made under the site of the fracture to allow escape of pus, and the wound was dressed daily. The patient left the hospital October 13th, and became a patient of Dr. C. On Novem-

ber 21st he became a patient of Dr. G., who operated and removed the first molar and a piece of bone one and one-quarter inches in length, and wired the jaws together. The wire in a few days slipped through the process and tissues, both upper and lower, causing severe laceration of the gums and necrosis of the alveolar process.

On December 11, 1905, sixty-three days later, I took an impression of the maxilla and mandible with modeling compound, for the purpose of making an interdental splint. The mandible was greatly swollen and much contracted toward the point of fracture. A running abscess was also present. Impressions were obtained with great difficulty. The casts were made in the ordinary way, and there being no occluding teeth, they were placed in the articulator, using the median line as a guide. The splint was constructed in one piece, covering the anterior upper and lower teeth. On December 12th the splint was inserted and held in place by being tied to the upper bicuspid and to the lower first molar and canine. On December 15th the bandage was removed, and the discharge of pus had ceased. A piece of necrosed bone, half the size of a ten-cent piece, was also removed. On December 22d the splint was removed, and a large opening was made between the four canines, exposing half the length of the lower incisors. This gave the patient more freedom of speech. Nourishment was taken through a tube, and also through the spout of a tea-kettle, behind the splint on the left side. The case is progressing nicely. I would take this opportunity to condemn the wiring of the jaws in fracture

cases when an interdental splint can be obtained for the asking, either at the New York College of Dentistry or the New York College of Dental and Oral Surgery.

Several weeks ago I discovered that the fracture was between the second and third molars. It has also developed since then that the upper right first and second molars and the lower left second and third molars articulated. The swelling was so great that the mouth could not be opened. Inasmuch as it would take too much time for all to see the case, I would request Dr. Sanger, Dr. Littig, and Dr. Deane to examine it, and give their opinions to the members present.

These gentlemen then examined the case as requested.

Dr. W. C. DEANE. I would like to report that it is a pleasure to see a patient in a case of this kind presented before professional men with such a clean mouth. I also wish to compliment Dr. Meyer on the results accomplished.

Dr. J. BOND LITTIG. I think the results are really more than might have been expected, in view of the circumstances and the time that elapsed before that fracture was treated properly.

Dr. R. M. SANGER. I can only reiterate what the other gentlemen have said.

Dr. MEYER. From the report of the examiners and the general appearance of the occlusion of the teeth, one would naturally infer that the fractured bones were in, or nearly in, their original position, but the X-ray picture taken two days ago tells a different story. While the forward part of the mandible is in position, yet the condyle has been drawn upward about one-half inch. This part, however, will slough off when thorough union has taken place.

Dr. DEANE. Might I ask why Dr. Meyer still continues to have the patient wear the splint?

Dr. MEYER. The union is not strong enough to warrant the removal of the splint.

Dr. DEANE. Why would not the use of a chin-piece and a head-bandage be indicated to draw the mandible inward?

Dr. MEYER. I am glad you spoke of that. The mouth having been open for over two months, naturally the muscles have stretched, and I have no doubt that after the splint has been removed the muscles will contract and bring the bite closer; but should they not contract sufficiently, I will grind off the teeth on the right side and bring them to a closer occlusion. But even if the occlusion is not perfect, the patient should be thankful for the result already attained.

Dr. Meyer then showed a plate he had made for a case where there was a large perforation of the palate. (See DENTAL COSMOS, 1906, vol. xlviii, p. 916.)

Dr. MEYER. I have the case in my pocket. The gentleman kindly sent it to me from Florida, with a letter saying, "For God's sake, doctor, don't let anything happen to this." I therefore have it in one pocket, and a dummy in the other. I will pass around the dummy and you can see the original if you wish after the meeting.

Dr. Meyer then read a description of the plate.

The paper of the evening entitled, "The Law and Ethics of Dentistry," was then read by Dr. F. W. PROSEUS of Rochester, N. Y.

Adjournment.

B. C. NASH, *Secretary*.

Monthly Meeting, March 1906.

THE First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, March 13, 1906, at the Academy of Medi-

cine, No. 17 West Forty-third street, the president, Dr. Arthur L. Swift, in the chair.

Dr. P. FIASCHI of New York pre-

sented two interesting cases, which the society were privileged to examine.

[Dr. Fiaschi's report of these cases was printed in full with illustrations in the DENTAL COSMOS for March, page 262, entitled "Report of a Case of Extensive Injury to the Bones of the Face, and of a Case of Post-Typhoid Osteomyelitis of the Mandible."]

The subject of the evening was then taken up. It consisted of an address by Dr. S. G. PERRY, New York city, entitled

A DISCUSSION OF THE MERITS AND DEMERITS OF THE GOLD INLAY.

In looking over the history of dentistry, it seems to me that in Dr. Atkinson's office there arose an ideal of dental operations that was perhaps as high as any that we have ever had. It is no injustice to those who are dead, or to those who are living and who had their first inspiration from that office in those early days, to say that no higher mark has ever been reached—before or since—than was worked out in Dr. Atkinson's office. You naturally think first of Dr. Varney, who had his inspiration in that office, Dr. Charles Butler of Cleveland, Dr. Delos Palmer and Dr. Eugene Palmer, co-workers with Dr. Varney, although at that time young men. I think it is a very safe thing to say that we have never reached a higher point in the art of filling teeth with gold than was reached by graduates from that office, even to the present time. I do not believe it is possible for human hands to ever do better work than was done by, we will say, Dr. Varney and later by Dr. Webb—of cutting very freely into the sound structure so as to avoid recurrence of caries underneath; so that the teeth should stand fairly supported, with the fillings in contact merely and the gold packed so as to make accurate adaptation to the teeth, and contouring the filling accurately to the anatomical lines of the teeth, so that the type of the tooth is reproduced—thereby very largely reducing the chance of caries in the future, and strictly safeguarding the gum.

If you carry that idea in mind, I think

you will all agree that that is the highest type of a filling for the approximal surfaces. If it can be carried out as perfectly as it has been done, you will agree that it is the best that could be accomplished. I think myself that today we are not doing better work than was done then. I doubt if we are doing as good, and I say that very deliberately. In those early days there was an inspiration in dental work which we do not find now, because it was the opening of a new field, and it is not surprising that men with firmness and decision like Dr. Varney should have done such work. Dr. Varney was a man of indomitable will power, and he insisted upon doing every operation as well as he could, whether it hurt the patient or not. I have seen him operate repeatedly where I would not have had the courage to cut as freely as he did. He packed the gold patiently, and very carefully. I have one filling which took him five hours, by the watch, to do. It is perfect, and it is doing good service today, although nearly thirty years since he set it in place. That is perhaps the ideal in dental work. How many of us, in this busy age and under the conditions existing, can always live up to our ideals? It was a kind of work which was a severe tax on the patient and on the operator. It was necessarily an expensive operation, and inasmuch as those perfect gold fillings were put in in teeth that were not perfect, or teeth that were so frail that they would become imperfect in time, it is not surprising that even the best filling would sometimes eventually fail.

So we as dentists are pardonable for seeking some easier way of filling the teeth that will attain the same final results. In all these years we have been struggling as earnestly as any class of men ever struggled for anything they wanted, to achieve some means of saving the teeth more easily and more quickly; some means which would save them as well as was done by that most difficult method of work.

It is not strange, therefore, that we were ever ready to grasp, as would a drowning man at a straw, anything that would help us to bring about this desir-

able result, and at the same time be a saving to the patient and ourselves. It is not surprising that we have dallied with amalgam; that we have striven with gutta-percha; and have struggled and been disappointed with zinc oxyphosphate and in the early days with zinc oxychlorid. We have been watching for some new thing, hoping that we might have something whereby the shapes of the teeth could be restored and sufficient strength for mastication given to all exposed surfaces, without defacing our patients with a great display of any filling material whatsoever.

When porcelain inlays came it was natural that we should almost stand on our heads, and throw our hats in the air, and say "At last we have found what we desired!—something to restore the shapes of the teeth and make them better looking; something we can use quickly and save ourselves the backache and the heartache—which when it comes from the contemplation of the failure of our fillings is worse even than the backache."

Of course it is an easy thing for men in their enthusiasm to be led to extremes, and I presume when we first used the porcelain we were so pleased with its appearance and the ease with which it could be inserted, that we did not stop to realize that it was brittle and inharmonious in a certain way—harmonious in appearance, but inharmonious with tooth-structure, because it was so brittle and so hard and unyielding. Gold has not that hardness, but has almost an elasticity—not like gutta-percha, but something which has made us feel, without stopping to reason it out, that aside from its appearance and its difficulty of insertion, gold is a very harmonious filling material, because of its pliability, if you know how to treat it, if you can get it in place without hammering the life out of it; and it wears down nicely and is swaged to even a better fit by future use.

I am very hopeful about the future, but yet I doubt—provided one takes the time and the patient can bear the strain and pay for the effort—whether we shall ever find anything better than gold in difficult places where the best material

must be used for saving the human teeth.

Gentlemen, do not let us lose our heads while seeking for these new things, and forget the old stand-by, gold—in foil form or in any form used by the early operators who marked the way for us. Of course we know that the operators who preceded that period when Dr. Atkinson's office became so pre-eminent did beautiful work, too; but they had not yet reached the ideal of restoring the shapes of the teeth, and they could not do it so well by their methods. It is no discredit to say of Dr. E. J. Dunning, who was probably the most eminent man of that period—in the presence of two of his relatives here tonight, from whom we hope much—that although he made beautiful fillings he did not restore the shapes of the teeth. Almost the only conversation I ever had with him was at a meeting of the Odontological Society, when he said to me that it was the regret of his life that he had filled the teeth as he did, and he wished he had the opportunity of living his life over, so that he might have more regard for the shapes of the teeth.

I have never been over-confident as to the success of porcelain inlays for the approximal surfaces of the back teeth, or the grinding surfaces to any great extent. I have been more than delighted with their use in the front teeth, where they show, and on the buccal surfaces where not much strain could come.

Years ago it happened that occasionally I observed that amalgam fillings had come out in a solid lump from cavities in which little caries was to be found; and sometimes cohesive gold fillings came out in a solid mass through decay around the fillings, or a breaking slightly of the edge—as it was my custom always to make shallow retaining grooves. This last was partly due to cowardice; I have always been a coward in regard to causing pain, but it is a mistaken kindness, and I would not advise the younger men to follow in my footsteps. They would make better fillings if they cut deeper.

When these old fillings came out, in the haste and hurry of my work, and wanting to do the best I could in a min-

ute or less, I would cut out the decay around the edges, and set the fillings back with cement, saying to myself that while perhaps it was not the most perfect thing that could have been done, it was a good operation, and one that would last many years. And that brings me to the point of saying what I have said to this society before—that I was prepared to be very sympathetic toward the gold or porcelain inlay.

When the idea of making gold inlays after the manner of porcelain inlays was found to be an available thing, I do not know but that I felt more satisfaction than I did at the advent of the porcelain inlay. Porcelain in the front of the mouth for esthetic purposes is invaluable, and I thank God I am alive to see porcelain fillings in the front teeth; for if there is anything I loathe and despise it is the display of gold in the human mouth. Think of it—the human mouth—a place where the best work should be done! Is there any art work that can compare with it? Is there anything more beautiful than to restore the natural appearance of the human mouth? It is art of the highest order.

But where hard work and permanence are required, I firmly believe the gold inlay to be one of the most important developments that have come to us. How little did we think that there was near at hand something that would supplement the advantages of the porcelain filling. While we formerly could do well for the front of the mouth, we can now do equally well for the back, and I am heartily in favor of the gold inlay.

There are quite a number of reasons why it should be hailed with great acclaim, aside from its advantage in this way. Remembering the perfect operations made by Dr. Varney, and considering them as the best—how many of us could make them in this hurried age; and even if we had the time, how many of us have the handicraft to do it? When it comes to the practical care of a practice, where our aim should be to give the greatest service in the shortest time, how many of us are fitted to do that, even if we consider it the best?

There are, however, some strong drawbacks to the gold inlay. It implies a large opening to get the gold inlay in, and severe cutting. In making the old contour fillings with gold, you could work the gold around a corner, or in a deep cavity, without sacrificing so very much of the tooth.

But this is a strenuous age. The older men in the profession realize more fully than the younger men—for their experience teaches them so—that we have to cut our garment according to our cloth. We must do the best we can, and sometimes we have to do mighty poor fillings, and we are glad to do it. I think a man may save a tooth even by doing poor work—the older men know what I mean—for there are some patients who will hardly let you do even “poor” work!

As to the method of making gold inlays: At a clinic before this society I showed a method using crystal gold. I had seen many complicated methods of doing it, and thought we could find a simpler way of getting the occlusion accurately, and likewise the proper contour. It occurred to me that the use of crystal gold placed in the cavity would give us an easy way of getting the contour accurately, as also the articulation; and when I tried that method I found that it was an easy thing—that the gold solder would go through the crystal gold as if it were a sieve. Yet the latter would hold up and keep its shape.

With the ball of the finger press the gold down, then let the patient bite on it, take it out and solder it, and it is done. You hardly have to touch it after that.

Since I showed this method at a clinic before this society, I have seen nothing to weaken my opinion of it. I think it is one of the best ways to get not only the contour, but the articulation. Then I went farther, and made many fillings in grinding surfaces, rubbing the matrix down and filling with crystal gold, and letting the patient bite it into place. Send it down to the laboratory, and you get it back soldered in ten minutes—a beautiful operation. I have used the crystal gold put into cement fillings for many years in a certain class of cases,

then building on to that with foil, and there is no question as to the advantage derived in the filling of frail teeth.

But there is one fault, after all, and that is the necessity of cutting away a large opening to get the inlay into the cavity—because the orifice must be as large as the largest diameter of the deepest part of your cavity, and in a frail tooth there is the danger of cutting too much.

Discussion.

Dr. JOHN I. HART. Dr. Perry has portrayed the necessity for inlay work, so that I shall just take up the technique of making the inlay. The method that appealed to me more strongly was that suggested by Dr. Nyman of Chicago, and more recently demonstrated by Dr. Dills of Brooklyn. To make an inlay by that method requires more time than by the method described by Dr. Perry, but the resultant inlay presents two distinct advantages: one, in that the hollow reinforced inlay contains a mass of zinc oxyphosphate over the pulp; and another, in that this hollowing out gives a much firmer hold to the cement in fastening the inlay into the cavity. The marginal cavity preparation is similar to that advocated by Dr. Black and his disciples.

The interior of the cavity I do not prepare along the same lines. Instead of having sharp or defined angles between the linguo-buccal and axial walls, those lines are more rounded. That facilitates the taking of the impression. If the cavity be very deep, I apply to it vaselin. Small narrow cups, not more than half an inch wide, are prepared of aluminum or platinoid. I always take three impressions, then if one or more of the casts should be destroyed, there will always be an impression to work on. Before dismissing the patient I take a bite in wax. The laboratory man makes up from the mold a fusible metal die, and also from the mold made with the bite strikes a fusible metal die. He strikes up a matrix of pure gold, No. 34 or 35 gage, with a hole punched in the center of it. He also strikes up the outer shell, which is made of No. 22 gold—35 or 36 gage. He

returns to me the outer shell and matrix. These are annealed, and after burnishing the matrix to place, the margins are trimmed quite close to the cavity margins and replaced and burnished; then the outer shell is burnished to place, and the patient is directed to bite in order to test the contour. Sometimes, with the contour pliers, the approximal surfaces are bent outward to increase the contour. These two surfaces, the inner and the outer, are returned to the laboratory man, and he unites the two and finishes them down. I have found it an advantage to solder an extra thickness of gold immediately under the opening in the inner shell, as will be indicated on the casts passed around. This eliminates the danger of grinding through the outer shell. The soldering is done through the hole on the under surface of the matrix. The cervical portion of an inlay for an approximal and morsal surface cavity should be finished before the inlay is inserted, as there is great difficulty in finishing that section of the inlay after it has been cemented to place. Just prior to the cementing of the inlay I make an undercut in the cavity, and when the latter is dry the inlay is cemented to place. I think as little finishing as possible should be done at that sitting, as there is danger, prior to the cement setting stony hard, of upsetting the inlay from the cement if much grinding be done at that time. At a subsequent sitting the margins may be finished so perfectly that an explorer passed over the margins will not detect any appreciable edge.

This inlay principle has so many possibilities that I brought down with me a case of worn or abraded surfaces of the upper anterior teeth. Prior to studying the inlay problem it would have been more difficult for me to restore those surfaces than it has been since. The surfaces, as you see, are worn to a very broad portion of the tooth. The patient being an individual of about sixty-two years of age, the pulp question did not trouble me very much. Two holes were cut into the morsal surface for the insertion of platino-iridium wire, No. 19 gage. The pins were left in the teeth

and removed with the impression. A platinum base was soldered to the pins, and clasp gold to restore the occlusion was built upon it. It is merely an extension of the inlay principle, and I can only say that if the inlay principle helps you out as it has me, you will be very grateful to Drs. Nyman and Hinman and the other gentlemen who have suggested it to us.

Dr. H. W. GILLETT. While Dr. Perry was speaking of those perfect foil fillings, it brought back to my mind a patient who came into my hands when I began practice in Newport, who had been under Dr. Perry's care. Her fillings were made at the time Dr. Perry was still making the Arthur separations between the teeth, so they dated back quite a long time—thirty-five years, Dr. Perry says. They were typical "Varney" fillings.

When Dr. Nyman told us about gold inlays that could be finished so that one could not tell them from the best gold fillings—well, I have a great deal of confidence in Dr. Nyman, but I smiled. It was not very long before a case presented in which I had to have something different from what I had been doing, so I tackled the gold inlays. It was not more than ten days before I began saying that I was through making large gold foil fillings; and since then I have taken an even stronger stand on this point. Those of my patients who have had gold inlays inserted are now unwilling to have foil fillings. In one or two cases, where cavities had been prepared for foil fillings, and by reason of circumstances gold inlays had been made for other teeth in the same mouth, before these large fillings were completed, both the patient and I had difficulty in getting on with the fillings; it seemed very irksome. I say all this with the full knowledge that there will be about a ton of perfectly awful gold inlays made in the vicinity of New York in the next year or two. The same men who make sloppy amalgam fillings, and worse gold fillings, leaving projections of the amalgam and gold sticking into the gum, will make the same kind of gold inlays, and we will shortly hear what terrible damage gold

inlays can do. They can; but gold inlays can be made that will be a great deal better for the tooth than the large fillings that we have been making so laboriously, because we get a support for the walls that we do not get from the foil filling. They can be finished just as perfectly, and with much less strain for patient and operator.

Dr. Perry has spoken fully of the general principles, and Dr. Hart has described the technique of the hollow inlay. I now desire to call your attention to two particular points.

First, however, I want to mention the peculiar adaptability of the inlay Dr. Perry described—the matrix filled with crystal gold and flowed full of solder—for the worn ("cupped") places common in the teeth of elderly people. You know how the best foil fillings are often swaged out of shape in such places. This inlay is wonderfully easy and effective in those places.

My present technique seems to me a little simpler than that described by Dr. Hart. It means more work for the assistant, but less at the chair. Here are some casts of practical cases that will be suggestive to those who have not already begun this work. These are all amalgam casts in which matrices are made for practical cases. I prepare the cavity very much as Dr. Hart described, and take the impression and "bite" at the same sitting. I do not see the patient again or do any more work in the mouth until the inlay is ready for the final fitting in the cavity. After taking the impression as Dr. Hart described, I take the bite in the following manner—taking an approximo-occlusal cavity in a bicuspid as a type: Stop up the undercut caused by the overhang of the adjoining teeth—with a matrix, or a bit of cotton, or in any other way—to permit of low-heat modeling compound being packed into the cavity accurately and withdrawn without dragging. While an impression tray is not needed, a good impression of the cavity is required, and great care should be taken not to let the compound get under the overhang of the adjoining tooth, so that the impression may come away easily. If the case be one

of a single cavity, and the adjoining tooth be a sound one, the matrix is usually essential. Select a narrow one that will not cover the contour or "knuckle" point of the contiguous tooth, and wedge it with cotton against the cervical margin of the cavity. With a large cavity in each tooth, a wisp of cotton to prevent the compound from being forced too far between the teeth at the cervix is usually all that is needed.

The compound cools quickly, and consequently must be packed rapidly. With the electric hot-air syringe soften the surface of the compound, and tell the patient to bite upon it. While I have been doing this my assistant has been warming a "true bite"—a name supplied to this material years ago when it was first furnished to us by the laboratories. It consists of two pieces of a higher-heat modeling compound about three-quarters of an inch long, and a little narrower, and about three-sixteenths of an inch thick—one on each side of laboratory tin foil. Supported in this way, it does not squeeze out of shape as much as happens when the patient closes the mouth quickly. In addition the foil prevents a hole at some critical point.

My assistant brings me the "true bite" as soon as I have allowed the patient to bite into the softer compound. The bite is taken in the ordinary way, the higher-heat compound attaching itself to that in the cavity, and bringing it away with it. The low-heat compound in the cavity will remain soft longer than the other. I frequently use the cold-air blast directed into the imprint of the opposing tooth to chill it after the patient has opened the mouth, and before removing the bite.

The compound comes away very readily, and when the resulting casts are mounted in the small anatomical crown articulators, I have found the result sufficiently accurate to do away with the necessity of seeing the patient again until the inlays are finished. The cast is made of any good alloy. The matrix is made in the amalgam cast, and put into the cavity in the bite casts. The shape of the filling is built up as Dr. Dills has de-

scribed, except that for most cases I find the low-heat modeling compound easier to use than the cement. Then the matrix and built-up compound are transferred to the amalgam cast and the cover matrix is swaged. The hole is cut in the center of the cavity matrix, and the margins of the two matrices are soldered together. The resulting shell is tried in the articulating casts, and any inaccuracy in regard to length or contour is corrected as if in the mouth. I find this process very satisfactory as any assistant becomes more familiar with it. I set one today which did not need to be ground at all, and the patient had not been seen after the impression was taken. The above-described technique enabled me to cover all necessary steps between the impression and the setting of the inlay, without seeing the patient. [Here the speaker exhibited three cases which showed the possibilities of the inlay method which he advocates.]

The other matter I wanted to speak of is in connection with the gold used for this work. In using 24-k. gold for the matrices, and 18-k. solder for filling them, if the occlusion is not just right and requires grinding, a mottled surface will result. The deep gold color will be shown in one part and the white color in another, and the inlay will be unsatisfactory. My own work of this kind is being placed in the hands of a young woman who is very much interested in this particular process, but she needs to have the difficult points simplified. An additional stimulation to my interest in finding a different gold has been the fact that I have a decided preference for gold in the mouth not as yellow as 24-k. My crown work has been done with a whiter gold, approaching clasp gold in color. It is more pleasing to me in the mouth than any other gold alloy with which I am familiar. The result of some experiments which I have had made has been that a matrix gold was delivered to me today—which I think contains one and a half per cent. of platinum—of very satisfactory appearance; also a casting gold or solder which is said to be nearly 24-k., and the color of which is exactly that

of clasp gold. For making a cusp, a piece of matrix gold is pressed into depressions of a die-plate, and filled with the special solder. If the top of such a cusp be ground off, one cannot distinguish the difference in color between the matrix and the solder. That seems likely to be helpful.

I have not had time for testing, but the maker tells me that there is more difference between the melting-point of those two golds than there is between those of 22-k. and 18-k. solder. I tried melting 24-k. gold plate on this matrix gold, and found it could be done. There

is some secret about the preparation of the casting gold or solder which has not been revealed to me. He assured me over the telephone that I might expect the solder to be very free from pits, and that it would flow "like water."

Dr. R. M. SANGER, Orange, N. J. Dr. Hinman called my attention to bridge-making, using inlays as piers. They were made similar to the one described by Dr. Hart. I used an inlay gold made by the Consolidated Dental Mfg. Co., of about 3/1000 of an inch in thickness.

Adjourned.

B. C. NASH, *Secretary*.

Monthly Meeting, October 1906.

A REGULAR monthly meeting of the First District Dental Society of the State of New York was held Tuesday evening, October 9, 1906, at the Academy of Medicine, No. 17 West Forty-third street, New York city, the president, Dr. Arthur L. Swift, in the chair.

Dr. MORRIS I. SCHAMBERG of New York, spoke on the Subject of "Extraction of Teeth a Surgical Procedure."

[This paper is printed in full at page 354 of the present issue of the Cosmos.]

Discussion.

Dr. JAMES F. HASBROUCK. I am glad that I am here before you, and that I have this opportunity to emphasize these facts which have been so ably presented. It is unfortunate, perhaps, that I cannot find some point upon which to differ with our essayist, as that might have made the discussion more interesting; but I am so heartily in accord with all that he has said that I fear the only remarks I can make will be commendatory.

Now, what is an operation, a surgical operation? Our authorities say it is the course of action or series of acts by which some result is accomplished—in surgery, the series of acts and manipulations per-

formed upon a patient's body, as in setting a bone, amputating a limb, or extracting a tooth.

It is a fact that most people look upon the operation of tooth-extraction as being without danger; and most cases are without danger, providing the patient and operator alike are willing to take necessary precautions. You may ask, What are necessary precautions? The answer I can give you in one word—cleanliness—and it would be a good thing if this motto were written in large letters over the door of every dentist's operating room. Of course it must be stated that no surgical interference of any sort is free from danger to life, and a distinction must be recognized between an operation performed to relieve human suffering, and one performed for some cosmetic effect. In the latter case, the danger should enter prominently into the consideration of the propriety of the operation, while in the former case the same danger would have little weight. There are many cases midway between these two extremes, and each must be considered upon its own merits.

The question may arise as to who is in fault when a tooth is broken, and this is a rather difficult one to answer. No one

is infallible, and given a skilful operator, dense process, and irregular or bulbous roots, something must give way in order to accomplish anything, and it is usually the end of a root. In most cases some abnormality is responsible for the mishap, and I cannot see that the operator is at all to blame. As to whether an immediate operation should be performed for the removal of the end of the root, that is a point upon which many arguments are advanced, both for and against. A very important factor is your patient's wish in the matter, although I have found most people tractable when the importance of having the operation completed was explained to them. Mostly, when there is no inflammation and the removal of the end of the root would entail considerable cutting, I favor allowing the end to remain; explaining to the patient that in case of any discomfort arising, the operation can always be performed, but that by waiting a little time, a broken root will always work toward the surface, and can subsequently be removed without any trouble. When a tooth is abscessed, or there is infection of any kind, I consider it most important to remove all broken pieces immediately. Our essayist has demonstrated the value of the X ray as a help to us in diagnosis, and I should like to ask him if in making examinations, he has ever had any trouble from burns?

We must all recognize the value of perfect operative technique, but the inside of the mouth is unique in that it cannot be made absolutely aseptic—only approximately so. But even partial asepsis will achieve very good results, and with antiseptic dressings and washes we can do very well. For any operation, I think the preparation of your patient's mouth is a matter of great importance; true, you cannot boil it or bake it, but by the use of antiseptic washes you can render temporarily innocuous any bacteria which may be roaming about. Another point is the preparation of the operator and his assistant. It is an acknowledged fact that many wounds have been infected by the operator's fingers—so a thorough cleansing of the hands is an im-

portant detail. The matter of sterilization of instruments has been spoken on so often that I do not think any man of ordinary intelligence would think of working in the mouth of a patient with any instrument that had not been properly prepared. After instruments have been used, they should be thoroughly scrubbed with soap and water to clean them of all *débris*, before they are ready to be prepared for the next operation.

In cases of abscess or infection from any source, I favor a thorough curetting of the abscess cavity. After irrigation, the cavity should be packed with iodoform gauze, and the dressing changed frequently, until a healthy granulating surface is established, after which frequent washings will be sufficient. There is a custom I have always looked upon with a great deal of apprehension, namely, that of packing a wound with absorbent cotton. Time and again have I seen this done by members of our profession, and I cannot decry it too strongly. The cotton, moistened by the fluids of the mouth, quickly forms a breeding-place for all kinds of pyogenic microbes, and becomes a menace of the worst kind.

The radiographs shown us have been particularly interesting. The one showing ankylosis of the jaw was especially so to me, and it shows a condition which is somewhat unusual. This I take it was a condition of permanent ankylosis, and operative interference was required for its correction. In daily practice we are most likely to meet with temporary ankylosis, which is a condition of tonic spasm of the muscles of mastication, resulting from irritation of the third division of the trifacial nerve, and inflammatory conditions of the soft tissues. The most common cause is probably the eruption of the third molars; and this brings us to the question of the advisability of the removal of the third molars, which I shall not attempt to answer at the present time, excepting in so far as to say that a tooth should never be extracted unnecessarily, neither should it be allowed to remain in the mouth when its retention involves the health, continued

discomfort, or perhaps the life of your patient.

Dr. JOHN I. HART. We are deeply indebted to the essayist for his presentation to us this evening. He has conclusively demonstrated the diagnostic value of the X ray. While we may deplore the necessity for the other branch of his paper, we must admire his clear presentation of the facts, and acknowledge our debt. Our proceedings are published, and as the conclusions which have been reached by our essayist are the conclusions of every thinking man, they will call the attention of those members of the profession who may not be exercising the precautions he suggests, and which are certainly necessary.

Many of us who have been practicing for some years have gone through different teachings on these subjects. In my early days, I listened to talks from recognized authorities, who suggested the use of cobwebs after operations, and it was not suggested in any jocular way, but just as earnestly as any of the proceedings this evening. There has been a natural evolution from that condition of ignorance to the present knowledge.

Ordinary precautions suffice in some circumstances, but there are conditions in which extraordinary precautions are necessary. Certainly, in the fourth and fifth stages of pericemental irritation the greatest precautions must be exercised before a root is extracted; but in the extraction of a tooth where there has been little or no pericemental irritation, the simplest precautions will secure immunity from injury to the patient.

The essayist has built up an interesting theory as to why at present so many more precautions are necessary for the health of our patients than formerly. His theory seems to be that in the greater efforts that are made to conserve teeth today, we retain teeth which have reached a pathological condition, and have rendered the surrounding tissue less resistant to infection. It may be true. It has seemed to me that in the last few years—say ten years—much greater precautions have been necessary after extracting than were needful years ago.

I did not know whether it was due to atmospheric conditions, or the lack of resistance on the part of the patient. It may be due to the causes he ascribes—a hypercementosis or the general or local inflammatory condition around the teeth. His theory may be correct, and if so it is interesting.

I have found a certain class of cases rather difficult to heal, namely, those in which we have to deal with a very thin alveolar process which had supported two or more roots. This process is liable to undergo a necrotic process, and unless there is a thorough burring away of the septum, the healing in such cases is extremely slow. It seems wise, I think, to anticipate what nature will do, and to remove the septum, so as to stimulate healing by granulation as quickly as possible.

Dr. Schamberg showed on the screen an upper lateral incisor with an abscessed condition around the root, and stated that if that were allowed to heal without curetting, a necrotic condition of the process would be likely to follow. It seems to me that such a condition would permanently interfere with the healing process, unless there was some successful effort made at curetting. In my judgment the necrotic condition existed prior to the extraction, rather than as a result of it.

I want to ask our essayist whether in his estimation, everything being equal, greater precautions are not necessary after the extraction of the lower teeth than after the extraction of any of the upper ones, without taking into consideration any pathological condition of the antrum—I am merely considering the natural drainage from the upper teeth and the natural drainage into the sockets of the lower teeth.

We cannot look for miracles at the hands of our specialists in this department; and where we ask them to extract the roots of teeth that are bayonet-shaped, or hypercementosed, something is bound to give way. They in all honesty make the effort, and if something does give way, even though they have taken all the precautions they should have used.

it is a misfortune, but no fault of theirs; and when we consider the efforts we make to conserve teeth, and some of the fragments we turn over to them to remove, I think the success they meet with should command our enduring gratitude. We should educate our patients that just as we expect them to return to us sufficiently often to conserve the roots of pulpless teeth, so they should return to the specialist as frequently as is necessary, until the sockets are filled with granulations which will protect them from infection.

Dr. M. L. RHEIN. I heartily agree with Dr. Hart's remarks as to the timely need of a paper of this kind for the profession. No one for a moment will oppose the conclusion that the extraction of the teeth is a surgical operation. I believe that is a well-recognized fact; the point is, Has it been so carried out?

During the twenty-six years of my practice I have seen great advances made in all forms of dental work. Notwithstanding some remarks that are occasionally made to the contrary, I believe all of us as dentists recognize that our professional work today is a great advancement over what it was twenty-five years ago. There has been an advance in operative dentistry along every line—with perhaps (up to a very recent time) this one exception as to the practical manner of extracting teeth; this has not kept pace with the other advances in operative dentistry. It has been a slur, in my opinion, upon the practice of operative dentistry, and to some extent a disgrace to us as dentists. It makes no difference whether we general practitioners have done the extracting or whether we have referred the cases to the specialist; I think American dentistry has been far in the rear in the past twenty years on the subject of how the teeth of patients should be removed, when the necessity for such an operation presented itself.

We all know that it is absurd to speak of such treatment of extractions as surgical operations properly performed.

Why has there been this dereliction in the true surgical handling of cases of extraction of the teeth? I speak of our-

selves, the dentists of the city of New York. The main reason, from my point of view, is that most of us have welcomed the opportunity of sending cases of this kind to men who claim to make a specialty of the extraction of teeth, and we at once rid ourselves of all responsibility connected therewith. We tell our patients to go to Dr. J. or Dr. A., and have such and such a tooth extracted, and then dismiss the matter from our minds.

Years ago when extracting teeth was on a par with the removal of corns, it received a fee that was somewhat on the same basis. The fee for extracting teeth seems to have remained the same right up to the present time, and in a city like this it is a most absurd one for such an operation.

What surgeon in New York city could do any operation under anesthesia and take care of the patient in an aseptic manner afterward for two dollars? That is the question in a nutshell. I claim it is our dereliction; it is our fault if we send patients where we know there will be no proper surgical care given. It is not only the aseptic precautions taken before an operation of this kind, but the after-care of a surgical case. Can you conceive of a surgeon performing an operation and then not seeing the case again, or not leaving it under the care of some other surgeon or assistant? It would be an unheard-of procedure; and yet we all know that as a rule this has been the dental procedure in the city of New York during our lifetime.

I claim it is the duty of each individual dentist to realize what is going to be done when a tooth is extracted, and if he does not want to take care of the case afterward, he should see that it is properly taken care of surgically until healthy granulations have covered the wound. This question is one that is opportune, because there seems to be an awakening to the necessity not only of speaking of the extraction of teeth as a surgical operation, but of carrying it out on that basis. Outside of a charity procedure, it is necessary under such circumstances that the patient pay a corresponding fee for a surgical operation.

I do not care whether the tooth happens to be free from infection or not. It may be that only one or two observations are necessary; but in this day of infections, it is essential that every case should be under observation until healthy granulations are distinctly in evidence.

There were some remarks made by the last speaker as to the blame when roots are fractured, etc., that interest me. I thoroughly agree with all Dr. Hart has said. It is absurd for us to blame a specialist because the ends of a root are broken or fractured in difficult cases. When a man uses ordinary precautions and skill, and such a thing happens, no blame should attach to the operator, and it has been unfortunate that a great many men feel they are blameworthy for such a thing. No shadow of blame can attach to a man if he will pursue the manly course in the matter, and inform his patient of the results. But where he deliberately conceals the fact that a portion of the root has been left in the alveolus, he is undoubtedly to be very much blamed, because, as has been well said this evening, there are differences of opinion as to the advisability of leaving in the alveolus the fractured ends of roots.

Dr. Hart has very wisely said that an abscessed fractured end will not give very much trouble by healing over, because, as a rule, it is impossible for it to heal over. There may be exceptional cases where the abscess may be drained through one of the sinuses, the mental foramen or the inferior dental canal, and then heal over; but ordinarily it will not. The fistula is there, and it will remain there so long as any remnant of that root remains in the alveolus. The dangerous cases are those in which the ends of the roots are not infected. They should never be left. Why? Because there the granulations are going to cover them, and encyst them for the time being; but the least disturbance in the health of such patients renders them liable to infection at that point.

Stop and consider that you have in the end of that root the remnants of pulp-material, and you can perceive how

easily infection can take place. It is for this reason that I take the position that the patient should invariably be informed of the urgent necessity for the removal of every portion of a fractured root-end. Of course the patient is always the arbiter as to whether an operation should be done, and if he refuses, that settles the matter so far as we are concerned; but professionally, it is our duty to insist on the removal of all fractured root-ends that may be left in, leaving it absolutely understood as a self-evident fact that there can be no blame attached to an operator because a root has been fractured.

Dr. SCHAMBERG (closing the discussion).

I wish to thank those who have taken part in the discussion of my paper, and also thank the silent members for their attention. I wish to apologize for having presented the subject in a rather disconnected fashion, overlooking points which would have been brought out had I had everything down in black and white.

Dr. Hasbrouck's question in regard to X-ray burns can best be answered by stating that I have made in the neighborhood of five thousand X-ray exposures without having caused a single burn. X-ray work has progressed so much within recent years that pictures are taken in fewer seconds now than it formerly took minutes. In skilful hands, exposures for dental radiographs are practically without danger. Unfortunately, newspapers continue to publish accounts of cases that were burned when little was known about X-ray work. The law is so tardy in meting out justice that cases you read about today are probably those which happened years ago, but which are just now coming to trial.

As to Dr. Hart's question: other things being equal, a tooth-socket in the upper jaw is more likely to heal in an uneventful way, from its being less likely to be troubled by the lodgment of food, and also because of the assistance afforded by gravity for drainage when pus is present. The case described, one in which an upper tooth-socket had healed leaving behind a focus of infection from an ab-

cess which afterward caused trouble about the tip of the nose, was one in which there was no doubt as to the socket having fully healed. This is what frequently takes place when care is not exercised to maintain the external opening until the cavity created by the abscess is filled with healthy granulations.

I am indebted to Dr. Hasbrouck for bringing up for discussion the subject of the fracture of roots, which I inadvertently omitted, though in presenting to Dr. Hasbrouck an outline of what my remarks would be, that point was touched upon. Never do I feel conscience stricken about the fracture of a root. A man who practices the extraction of teeth as a specialty, and endeavors to give each case his best attention, need not blame himself when such a mishap occurs, nor need he have any hesitation about letting the patient know what has happened. Roots at times are so divergent and frail, and the process so dense

that the root gives way before the process. When a fracture occurs the question arises as to whether an effort should be made at once to remove the remaining portion. Only when the end justifies the means are we warranted in subjecting the patient to what may be a most difficult operation. The patient's wishes in the matter must be considered, but inasmuch as the operator is in the better position to judge of the difficulty or ease with which the removal can be accomplished, and what the consequences will be if the part is allowed to remain, the patient should be advised accordingly. If the root is allowed to remain, the patient should be instructed to return upon the first indication of trouble therefrom.

A very hearty vote of thanks was given to Dr. Schamberg for his interesting address.

Adjourned.

B. C. NASH, *Secretary*.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canada, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the Editor, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGERS of the Dental Cosmos, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, APRIL 1907.

EDITORIAL DEPARTMENT.

THE AMPHOTERIC REACTION.

THAT acids turn blue litmus red and that alkalis restore the blue color to litmus reddened by an acid, and further, that acids and alkalis combine to form salts by neutralizing each other, are facts in elementary chemistry not only well known to students of science but they may be regarded practically as common knowledge. So well established is the belief that any substance which will redden litmus paper is acid, and can be neutralized by any substance capable of turning red litmus paper blue, that the litmus test has come to be regarded as indisputable evidence of the presence or absence of acids or alkalis as the case may be. So generally accepted is the belief in the foregoing data that for many years it has passed unchallenged as to its accuracy.

The careful study of the reaction of the urine, and more recently of the saliva, has brought out the curious fact that in some cases it happens that a specimen of urine will not only turn blue litmus paper red, but will also give a blue reaction

with red litmus paper at the same time—in other words, it exhibits what is known as the “amphoteric” reaction.

Investigation of this curious phenomenon reveals the fact that the acidity of the specimen is due not to a free or uncombined acid, but to the presence of acid sodium phosphate, a salt in which the hydrogen of the phosphoric acid is but partially replaced by the positive element sodium; while the alkalinity of the same specimen is due to the presence of the basic phosphate, in which twice the number of hydrogen atoms of the phosphoric acid are replaced by the positive element sodium;—the acid and alkaline reaction to litmus in the case of an amphoteric urine or other fluid being due to the fact that the two salts exhibiting respectively the acid and basic reactions are incapable of neutralizing each other, which leaves both types of salts free to exhibit their characteristic activities and their respective effects upon litmus. This peculiar phenomenon may be easily studied by mixing solutions of equal strength of the acid and basic sodium phosphates in varying proportions, when, by careful balancing of the quantities used, a point will be reached where both acid and alkaline reactions to litmus will be exhibited by the mixture.

The fact that these two salts are incapable of chemically neutralizing each other is of the utmost importance in the study of the reaction of the urine, and of the saliva as well, for the reason especially, in the case of the saliva, that the reaction of the oral fluids is a factor of fundamental importance in connection with the phenomena of dental caries and likewise of dental erosion. The litmus test alone appears to be wholly inadequate for the purpose of determining accurately the question of the presence or absence of acids or alkalis in the oral fluids. It is inadequate because, bearing in mind the fact that acid salts of sodium and of calcium are capable of exerting a solvent effect upon enamel, and also bearing in mind the fact that the presence of these acid salts in the saliva may be masked or obscured by the simultaneous presence of an amount of basic sodium phosphate sufficient to nullify the litmus test from an optical standpoint, it is therefore necessary to adopt other means than the litmus test, or in connection therewith, to determine acidity of the saliva, and thus learn whether it may be the fact in any given case that even though the specimen may turn red litmus blue there may never-

theless be acid salts present which are chemically capable of acting upon the enamel detrimentally.

The subjoined communication from Dr. Head bears directly upon the subject here discussed. We believe it to be practically impossible to say from litmus tests alone whether a saliva is acid-free or not, in view of the possibility of the existence of unneutralized acid salts in that fluid; we might be almost justified in saying the *probable* existence of these acid salts in the saliva—for certain it is that they very commonly exist in the saliva of arthritics, and their detrimental effect upon tooth-structure is now well known, though to what extent this effect may be modified by other salivary constituents has not been as yet made out.

In view of the reliance which has been placed upon the litmus test in the past, and the confidence which has been reposed in conclusions based upon the litmus test of the oral fluids, we deem it important that this grave source of error in its efficacy should be noted, for in view of its inadequacy as a means for determining the salivary reaction we are of the opinion that all reports heretofore made of the reaction of the oral fluids based solely upon the litmus test are, in the light of the data herein referred to, practically untrustworthy.

Dr. Miller's Litmus Test.

1500 LOCUST ST., PHILADELPHIA, March 19, 1907.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I should be glad to have some information concerning Dr. Miller's recent experiments and observations on the wasting of tooth tissue, etc.

Two years ago I carried on some experiments concerning the causes of so-called erosions at the necks of the teeth, which, while not nearly so extensive as Dr. Miller's, seemed to lead to the same conclusion—namely, that grit on a tooth-brush is a fruitful cause of so-called tooth-erosion, which under these conditions should be called abrasion.* In addition to this it seemed probable that there might be a chemical cause also in some cases. I have been working with this in view ever since, and have some data that coincide with those of Dr. Miller and some that do not. I have been seriously held back in my work by a difficulty that has not troubled Dr. Miller, viz, the lack of a simple test that will make one assured whether the saliva and mucus of the mouth is really alkaline, neutral, or acid, and to what extent the alkalinity and acidity exist.

Sutton, in his "Volumetric Analysis," page 39, speaks of the well-known

*See *Dental Brief*, vol. xi, p. 279.

fact that a saliva which is neutral to litmus may be acid to turmeric paper and alkaline to lacmoid or Congo red.

In my own experiments I have also found that it may be alkaline to phenol-phthalein under these same conditions. Of course, if the litmus shows a very marked red these contradictory reactions will not appear. As it is known that some salivas will turn blue litmus paper red and red litmus paper blue, this would seem to prove that litmus is not of itself to be relied upon unless it be used in connection with control tests made with other reagents. These tests, so far as the saliva from the parotid, sublingual, and submaxillary glands is concerned, can readily be carried on, as a few cubic centimeters can be so obtained in a few minutes by chewing rubber; but when we come to testing the mucus of the cheek the problem becomes difficult, as it is practically impossible to get enough mucus to boil, and saliva unboiled and containing dissolved carbonic acid is unreliable in giving alkaline or acid reactions with practical sensibility to either litmus or phenol-phthalein; therefore any tests of such mucus with litmus paper have seemed to me most untrustworthy and not to be relied upon. As above noted, such mucus may turn red litmus blue and blue litmus red; and litmus paper when wet with the mucus may look deep blue, and when dried may be neutral or quite red. This possibly is due to the fact that existing CO₂ has been driven off during the process of drying, which also happens when the saliva is boiled. All this brings me to my original question: How can Dr. Miller accurately test the alkalinity or acidity of salivas with litmus alone? Or, if he uses control tests, what are they?

So far as I can discover, Dr. Miller depends simply upon litmus for his acidity tests. In the *Cosmos* for March 1907, on page 228, he says: "The reaction of the mucus of the upper as well as of the lower lip should be taken by lifting up the lip and inserting a strip of blue litmus paper on one side of the jaw and red on the other, leaving it there until saturated. To determine whether the acid comes from the lip or from the gums, insert two pieces of litmus paper separated by any impermeable substance which does not affect the reaction. The reaction should be taken before rinsing the mouth, as in this way only do we obtain true information as to the condition present at that time." [Italics mine.]

I wish to ask you, as one who has done much for dental chemistry, if accurate information as to the acidity or alkalinity of the mouth can be obtained by the litmus test just advocated? The great suggestiveness of Dr. Miller's paper is unquestioned, yet I cannot help feeling that if the technique of his litmus tests are not satisfactorily explained, much of the conclusiveness of his paper will be lost, owing to the inaccuracy of the preliminary mouth-tests on which his experiments are necessarily based.

Yours truly,

JOSEPH HEAD.

A CORRECTION.

WE have been requested by Mr. A. Hopewell-Smith, whose article on "A Study of the Vascular Lesions of the Dental Pulp, Their Complications and Clinical Significance," appears on page 124 of the February issue of this journal, to call attention to an error which occurred in the manuscript of the paper and which remains uncorrected as printed, to wit: The word "atrophic," in the first line, second column, page 139, should read *trophic*.

BIBLIOGRAPHICAL.

THE AMERICAN TEXT-BOOK OF PROSTHETIC DENTISTRY. In Original Contributions by Eminent Authorities. Edited by CHAS. R. TURNER, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy, Department of Dentistry, Univ. Pa., Philadelphia. Third Edition, thoroughly revised and rewritten. Octavo, 900 pages, with 916 engravings. Cloth, \$6.00; leather, \$7.00.

The third edition of the "American Text-book of Prosthetic Dentistry" is practically a new book. New not only because the text has been completely revised and greatly amplified by new matter and a wealth of new illustrations, but new in a larger and more important sense in that the entire subject has been treated from an original point of view, so that the theme is developed from a new *motif*.

- Mechanical dentistry has been too long just what the phrase means, mechanical pure and simple, and the intricacies of its multitudinous processes have demanded so much time and mental concentration upon the part of the student that it has produced the unfortunate tendency to regard the mechanics of dentistry as the end of dentistry, rather than to regard mechanics as a means to an end in dentistry. The editor of the "American Text-book of Prosthetic Dentistry" has undertaken to set this matter right, and he has set it right by so treating and arranging his work as to place dental mechanics in its correct and rational relation to dental prosthesis. The book is an epoch-making work—epoch-making because this volume is the first and

only comprehensive treatise in which from first to last a conception of the true purpose and dignity of mechanical dentistry as a prosthetic art has governed the treatment of the subject in all its relations.

The general arrangement of the work is logical, beginning with a consideration of the dental laboratory and its equipment, followed by a discussion of the materials used by the prosthetic dentist, including porcelain teeth and their manufacture. This phase of the work may be regarded as a section by itself, and as preliminary to two chapters that are the real foundations of prosthetic dentistry. There is a chapter by Professor Turner upon The Human Dental Mechanism—its Structure, Functions, and Relations, in which the dental mechanism is studied as a normal or perfect apparatus, and a chapter written by the editor in collaboration with Prof. A. H. Thompson, in which The Modifications of the Dental Mechanism by Age, Temperament, and Use are set forth. In these two chapters the student is brought face to face with the functional conditions that it is his province to restore when by loss of the natural denture they are destroyed or impaired. We know of no similar detailed exhibit of the functioning of the human dental mechanism or one which so comprehensively or lucidly sets forth the engineering features, if we may so express it, of this apparatus and its mode of operation, and we think that the dental profession is distinctly indebted to Professor Turner for not only producing a classic upon this par-

ticular subject, but for supplying the fundamental data upon which to build an intelligent and rational practice in dental prosthesis.

From this point the evolution of the subject proceeds in normal order by chapters upon The Examination, Preparation, and Study of the Mouth Preliminary to the Insertion of Artificial Teeth, written by Dr. H. H. Burchard and Prof. J. P. Gray; Taking Impressions of the Mouth, and The Making of Casts and Their Preparation, by the same authors; then the subject of Dies, Counter-dies, and Molding is treated by Dr. William H. Trueman. After which the subjects of Taking the Bite, The Principles Underlying the Retention of Plate Dentures, and the Selection, Arrangement and Retention of Artificial Teeth are presented in three chapters by Professor Turner.

Vulcanized Rubber as a Base for Artificial Dentures is ably set forth by Prof. George H. Wilson; Swaged Metallic Plates, by Dr. W. H. Trueman; Cast Dentures, by the late Dr. Clark L. Goddard; Continuous-Gum Dentures, by Dr. D. O. M. LeCron. Artificial Crowns, and The Assemblage of United Crowns (Bridge Work) are chapters originally written by the late Dr. H. H. Burchard and now revised to date by Dr. Fred A. Peeso. Dr. Chas. J. Essig's chapter on Hygienic Relations and Care of Artificial Dentures remains under his name, and the work closes with the chapter on Palatal Mechanism by Dr. R. Ottolengui.

Our space limitations make it quite impossible to give anything like a detailed picture of the excellent features of this monumental work, but of this we are well assured—that it presents the subject not only in a new light, but it opens up vistas of scientific interest and scientific possibilities in pros-

thetic dentistry which have not heretofore been realized except by extremely few. It has demonstrated the artistic factor in dental prosthesis, emphasized its possibilities, and has created standards which if intelligently followed will double the debt of humanity to dentistry by adding to its recompense of gratitude for the relief of suffering and restoration of health, additional gratitude for relief from deformity and for the restoration of comeliness.

The work is singularly free from textual errors; some few, however, we have noted which should be eliminated. For example, in Dr. Hodgen's chapter, at page 139, the last paragraph is a quotation taken from page 860 of vol. iii of the "American System of Dentistry," by Litch; it relates to the effect of ignition upon purple of Cassius, and is not only unintelligible in the way the quotation is placed, but it is incorrectly quoted, the introduction of the word "not" completely inverting the meaning of the original. The statement (same paragraph) that "Purple of Cassius is soluble in ammonia before *fusion*," is also misleading and incorrect, as purple of Cassius is not fusible at all, but it decomposes upon ignition—which latter was the word probably intended. At page 306, C. H. Ward is credited with the grading of wear of the teeth into four degrees. This is the system of Professor Broca of the Faculté de Médecine, from whom Ward reproduced the idea.

Some few instances of misspelled proper names occur, *e.g.* J. H. Wassal (page 305) for J. W. Wassall; LaForge (page 434) for Laforgue, the inventor of spiral springs.

The buttressed architecture of the basal support which the cranium gives to the maxillary alveolar border, described

at page 231, is incorrectly credited to H. H. Burchard, who republished the suggestion from A. H. Thompson,* who enlarges the idea from Harrison Allen and Jeffries Wyman; while Fig. 197, illustrating the mandible as a lever of the third class, should have been credited to Burchard, who devised the diagram and executed the original drawing from which the illustration was made.†

The illustrations, which have been greatly increased, are admirable—with a single exception, Fig. 220, which is a silhouette; it should be replaced by a sectional detail view, which would be much more instructive and less difficult of analysis.

Errors of this character are inseparable from the production of a work of this kind, and the wonder is that this one is so remarkably free from them. We congratulate the editor and his co-laborers upon the splendid result of their efforts, and the dental profession upon now having the best work on prosthetic dentistry that has yet appeared in any language.

ANATOMICAL NOMENCLATURE. With Special Reference to the Basle Anatomical Nomenclature [B. N. A.]. By LEWELLYS F. BARKER, M.D., Professor of Medicine, Johns Hopkins University, etc. Two colored and several other illustrations. Philadelphia: P. Blakiston's Son & Co., 1907.

It seems unnecessary to review the advantages that would accrue through the adaptation by anatomists, biologists, pathologists, and clinicians of a uniform system of objective anatomical nomenclature. The work now before us—a care-

fully compiled list of anatomical terms—exemplifies the untiring efforts of the host of distinguished anatomists who at the Basle anatomical conference of 1905 presented the results of their labors, extending over a period of six years, in the shape of a rational vocabulary of about 5000 anatomical terms, instead of the 30,000 simple and compound words at present in use by teachers and writers on this subject. To have reduced and simplified the old terminology to about one-fifth of its original volume, without in the least sacrificing the primal object in view, is an achievement for which both students and teachers of the subject must feel deeply indebted to the commission and to Dr. Barker, through whom the matter is now presented to the American world of science.

As bearing more or less directly upon dentistry, we note a number of terms to which we most particularly desire to call attention. In each case the B. N. A. terminology precedes the old one: Mandibular fossa (glenoid cavity); maxilla (upper jaw, superior maxillary bone); anterior surface of maxilla (external or facial surface); mandible (lower jaw, inferior maxillary bone); maxillary sinus (antrum of Highmore); mandibular foramen (inferior dental foramen); mandibular canal (inferior dental canal); canine (cuspid); premolars (bicuspid).

In the portion of the book devoted to anatomical dental terminology, we find terms which we trust may be substituted by the more accurate ones in a future edition. We refer to "chewing surface" instead of *occlusal surface*; "foramen of apex of tooth" instead of *apical foramen*; "smaller dental canals" instead of *dentina! canaliculi*; "superior dental

*DENTAL COSMOS, vol. xxxv, p. 594.

†Burchard, "Dental Pathology, Therapeutics, and Pharmacology," p. 173.

arch" instead of *upper dental arch*, and "inferior dental arch" instead of *lower dental arch*.

The historical chapters at the beginning of the work, by the editor, are deserving of a special word of commendation,

and there, as well as throughout the book, he has displayed that degree of care and editorial attention which necessarily leads to the production of reliable works.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*L'Odontologie*, Paris, February 15, 1907.]
ON THE SEPARATION OF PLATINUM, GOLD, AND SILVER FROM A MIXTURE OF LABORATORY FILINGS. BY L. LEMERLE, PROFESSOR AT THE ÉCOLE DENTAIRE OF PARIS.

The method about to be described of separating platinum, gold, and silver from laboratory filings is the one followed by a well-known Parisian firm of assayers. The quantities of the different chemical reagents and substances given throughout this review are the quantities to be employed in treating a weight of filings of about 100 gm.

Dissolution. Place in a glass globe of one-liter capacity the quantity of filings to be treated and a mixture of 150 gm. nitric acid C. P. and 450 gm. hydrochloric acid. Heat the globe over a dull fire or in a sand-bath.

Evaporation. When the filings have been dissolved pour out the contents of the glass globe into a porcelain dish, and evaporate the fluid slowly to a syrupy consistence. Now add to the syrupy fluid 100 gm. of hydrochloric acid, and cover the dish with a funnel to prevent any portion of the liquid from splashing out on account of the active reaction which takes place upon the addition of the hydrochloric acid. When the reaction is completed, evaporate the solution as in the previous case, to expel the excess of acid.

Separation of silver. Add to the liquid 300 gm. of distilled water, and heat for about one hour in order to complete the precipitation of silver chlorid. Filter, and collect the filtrate in a glass of 750 ccm. capacity.

The precipitate of silver chlorid which remains in the filter is washed three or four times with boiling water, and this water is added to the filtered solution.

Separation of platinum. To the filtered solution 150 gm. of pulverized ammonium chlorid are added, and the contents of the glass are stirred with a glass rod and allowed to decant for at least six hours. The platinum will now be found precipitated in the form of chloro-platinate of ammonia. The platinum precipitate is now collected by filtering, and is washed with 200 gm. of cold water to which 30 gm. of sal ammoniac have been added. The platinum precipitate and water are again filtered and the liquid is collected in a glass receptacle of one-liter capacity.

Separation of gold. In the latter receptacle, 100 gm. of crystals of ferrous sulfate are dissolved, stirring the mixture from time to time with a glass rod, and allowing it to decant for eight to ten hours. The gold is slowly precipitated in the form of a brownish powder. The contents of the glass receptacle are now filtered in order to collect the brown powder, which should be thoroughly washed, as in the case of the silver chlorid.

The separation of the precious metals being now completed, it remains to convert the products thus obtained into metallic form.

After having been completely dried, the silver chlorid is placed, together with the filter in which it is held, in a crucible, where it is fused with a mixture composed of three times its weight of sodium carbonate and

four per cent. of its weight of charcoal. After the mass has been fused and cooled, the crucible is broken and the silver ingot is removed. The chloro-platinate of ammonia is detached from the filter and the paper is burned in a porcelain dish, in order to collect the small particles of platinate that may have remained attached to the paper. Into the same porcelain dish the platinate is placed and calcined, heating the dish slowly and progressively and carrying it eventually to a white heat, at which point it should remain until the evolution of white fumes has ceased. The gold is treated by the same process as described in the case of silver, with the exception that instead of the sodium carbonate and charcoal mixture it is fused with three times its weight of borax and once its weight of saltpeter.

[*Le Progrès dentaire*, Paris, February 1907.]
POINTS ON THE TREATMENT OF STOMATITIS. BY DR. RAOUL LABBÉ.

Dr. Labbé (*Rev. des Connaissances méd.*, April 15, 1906) discusses the treatment of stomatitis as follows:

(1.) An attack of stomatitis, of whatever form it may be, requires general hygienic and dietetic treatment, which must necessarily vary according to the degree of contagiousness of the attack.

(2.) When the attack is of enanthematous nature, the patient should be isolated during a period which should be made to vary according as to whether the attack is one of impetigo, thrush, ulcerous stomatitis, etc. Each tetter should be antiseptically treated, and if the patient be an infant who is being fed from the mother's breast, the latter should be likewise antiseptically treated.

(3.) In infants fed on the mother's milk, such forms of the disturbance under consideration as thrush and exfoliative stomatitis are rare, but those fed on cow's milk, in addition to these forms of stomatitis, may also suffer from the aphthous variety, which may be transmitted to the infant from a cow suffering from aphthous fever.

(4.) The mouth should be frequently irrigated with alkaline one per cent. solutions of either potassium chlorate, sodium borate, or sodium bicarbonate, or swabbed with either of these agents in stronger solution—say five

per cent. In addition, the use of the following mouth-washes are recommended:

R—Sodii hyposulphatis, gr. lx;
Glycerinæ,

Aquæ destillatæ, āā ʒij. M.

Sig.—To be used as a mouth-wash morning and evening.

R—Sodii biberatis,
Potassii chloratis, āā gr. lxxv;
Aquæ destillatæ, ʒij. M.

Sig.—To be used as a mouth-wash in cases of severe stomatitis several times a day.

Against the fetidity of the breath either a solution of potassium permanganate 1:1000 or dilute hydrogen dioxid solutions may be employed.

(5.) The general condition of the patient should be given proper attention, especially if he be of the cachectic diathesis. In such cases, the administration of purgatives is strongly indicated.

[*Le Laboratoire*, Paris, January 13, 1907.]
A GLASS SOLDER. BY CH. MARGOT.

M. Margot states that an alloy composed of tin 95 parts and zinc 5 parts, which melts at 360° F., adheres to glass tenaciously, and possesses an unalterable metallic luster. An alloy of tin 90 parts and aluminum 10 parts, melting at 572° F., also adheres strongly to glass surfaces. By means of either of these formulæ two glass surfaces can be united as if they were of metallic composition.

[*La Odontologia*, Madrid, February 1907.]
ON THE ACTION OF GENERAL ANESTHETICS. BY DR. NABIAS, BORDEAUX, FRANCE.

The author (*Journal de Méd. de Bordeaux*) has carried on a series of investigations in view of determining, if possible, the nature of the action of general anesthetic agents. He describes in detail the experiments which have led him to conclude that anesthetics act by inducing dehydration of the nerve cells. In view of this conclusion, and in order to preclude the possibility of the anesthetic dehydrating the nervous protoplasm to a degree at which functional activity could not persist, Dr. Nabias recommends first that the agent should be administered slowly and

carefully, and second, that the patient be made to drink a large glass of water every half-hour for at least six hours before the time set for the anesthesia. This preventive measure originated by Denucé has been productive of extremely satisfactory results, and in the cases to which it was applied by him—at least twenty—not only was there complete absence of ill effects during the administration and subsequent operation, but likewise not even the slightest post-operative vomiting or nausea.

[*Archives de Stomatologie*, Paris, November 1906.]

ON THE FUTILITY AND DANGER OF TREATING COCAIN POISONING WITH MORPHIN. BY DR. VAILLARD.

It was by observing that morphino-maniacs possessed a high degree of tolerance to the effects of cocain that Magnan-Chauppe was led to experiment with morphin as an antidote to cocain. These two agents induce physiological effects of opposite natures, and as was pointed out by Laborde, a fatal dose of cocain has not resulted in death when administered following the injection of a dose of morphin. But, unfortunately, the antagonizing therapeutic effects of morphin are not so pronounced when the agent is administered in severe cocain poisoning, namely, after the effects of the latter alkaloid have fully developed. Pouchet, who has studied the question, is of the opinion that while atropin, chloral, and chloroform are capable of decreasing the intensity of the convulsive paroxysms in cocain poisoning, morphin either stimulates them or decreases them (uncertainty of action). Consequently, Pouchet recommends the rejection of all narcotics in the treatment of cocain poisoning. Chloral, of course, is, to a certain extent, an antidote to cocain by virtue of its vaso-dilator action; but in this connection it must be borne in mind that while certain symptoms may be attenuated, the toxic action of the partial antidote will render the toxic effects of the original poison still more pronounced.

A case of fatal cocain poisoning, reported by Lacassagne and Rolland in the *Archives d'Anthropologie criminelle* for January 1905, shows that morphin, at least in that particular case, hastened the fatal termination.

Until more careful studies of cocain poisoning shall have been made, it would be well, in Mr. Vaillard's opinion, to limit the treatment of cocain poisoning to inhalations of oxygen. Such agents as chloroform, ether, and amyl nitrite should be employed with the greatest caution, if at all.

[*L'Odontologie*, Paris, February 28, 1907.]

DENTAL ECTOPY AND NASAL SUPPURATION. BY J. SORDOILLET, INTERNE OF THE HOSPITALS OF NANCY.

The essayist discusses the relationship between dental disturbances and pathologic phenomena in organs which to all appearances are, from an anatomic and morphologic viewpoint, independent from the oral tissues to which the origin of the disturbance may be eventually traced. In the presence of a nasal suppuration, after excluding infection of the maxillary sinus, one would hardly be inclined to search for the etiologic cause in the teeth or surrounding tissues. However, an interesting case in the service of Professor Jacques has recently come under M. Sordoillet's observation, which not only illustrates the pathologic enigma under consideration, but in addition points out the irrefutable fact that none of the specialties which are designated collectively under the term medicine can be, strictly speaking, considered in the light of isolated branches of the mother profession. The dentist who fails to recognize the relations of his specialty to those of otology, ophthalmology, rhinology, laryngology, and *vice versa*, and the practitioner who devotes himself almost exclusively to the treatment of gastric, pulmonary, and other diseases in which the issues of life and death are more salient, and who similarly neglects to dispense a fair degree of observation to the conditions coming under the headings of the above enumerated specialties, are working in semi-darkness that is the more deplorable because of its possibly evil, if not fatal, effects upon the lives of those under their care. In these days of so-called rational therapeutics, for a practitioner to make a diagnosis of any pathologic condition in which all possible etiologic factors involved have not been duly weighed, whether within his own field of action or far beyond the boundaries of his specialty, is comparable

to the often-quoted speculations of the imaginative knight-errant immortalized by Cervantes, when mistaking the windmills for a gigantic soldiery on the ground that the revolving "arms" could be but the upper extremities of animate things.

The clinical case and *raison d'être* for the above remarks was as follows: M. H., age forty-five years, complained of a respiratory difficulty on the left nasal side, of several months' standing, and complicated during several weeks past by a pyogenic discharge from the nostril of the corresponding side. At irregular intervals he would perceive a certain fetidity. About a month prior to his consulting M. Sordoillet, an abscess developed on the left side of the palatal vault and a little beyond the median line. The phlegmon disappeared without spontaneous breaking or surgical intervention. The patient did not complain of pain in the nose, but at times had suffered from pain above the socket of the upper left canine, which several months previously had been extracted for reasons not stated by the author. The intermittent pain was accompanied by a recrudescence of the nasal discharge. An examination of the mouth revealed a generalized inflammation of the mucous membrane, the presence of many roots, and of fragments of roots. The remaining sound teeth were in irregular and abnormal positions. Behind the upper left first bicuspid—a healthy tooth to all appearances—a fistulous tract was discovered into which an explorer could be introduced and carried backward for a distance of 15 mm., when it would encounter a hard, unyielding surface. In the left nasal cavity, and at a point corresponding with the location of the mouth-fistula, a painful and bleeding swelling could be detected which communicated with the fistula opening into the mouth. Under chloroform all defective and diseased teeth were removed, and the palatal mucous membrane was dissected backward from the median line to the first bicuspid. The region corresponding to the internal wall of the alveolus of the left canine was the seat of a severe osteitis. The area was thoroughly curetted to a point opposite the left central incisor, where a sound tooth was found lying in a horizontal position, with the apex within the maxillary sinus. The

tooth was removed, and the wound having been properly treated, the patient very soon recovered, and, as may be surmised, was not again inconvenienced by a nasal discharge.

[*L'Odontologie*, Paris, February 28, 1907.]
ON A NEW METHOD OF TREATING PERICEMENTITIS BY MEANS OF LOCAL INJECTIONS OF SODIUM SALICYLATE.
By D. MARGERY.

In the February 1907 issue of *La Revue de Stomatologie*, the author describes his adaptation to the treatment of pericementitis of the method suggested by Professor Bouchard for the treatment of acute articular rheumatism by means of injections of sodium salicylate *in loco dolenti*, and applied to dental surgery by Dr. G. Lemerle. The quantity of sodium salicylate in two to three per cent. solutions to be injected varies from one to two cubic centimeters, according to the size and number of roots of the affected tooth. This treatment should be instituted as an auxiliary measure, and only in cases in which the ordinary methods of treatment have failed to relieve the intensity of the symptoms. In the presence of extreme pain the method under consideration is particularly indicated, but the reader should bear in mind the important fact that the injections are not altogether devoid of danger, for among the cases reported by Dr. Margery we find two in which the operation was followed by sphacelus, which in one case led to the elimination of an alveolar sequestrum. The injection may be performed either in the gingivo-buccal groove or in the neighborhood of the gingival margin. The contents of the syringe should be slowly expelled.

[*Archives de Stomatologie*, Paris, November 1906.]

A CASE OF SYPHILITIC LESION OF THE TEMPORO-MANDIBULAR ARTICULATION. By DR. W. STERLING.

The essayist describes the case of a man aged twenty-five, who on account of a lesion in the temporo-mandibular articulation experienced such difficulty in opening the mouth that he was prevented from taking solid nourishment. The onset of the morbid phenomena had been marked by pain, at first in the left articulation, and fifteen days afterward in

that of the right side. The clinical history of the patient showed that five years previously he had contracted syphilis, and that after the appearance of the characteristic roséola had been started on a specific cure, at the conclusion of which he found himself so far recovered that no additional treatment had been found necessary. Since that time, up to the onset of the disturbance under consideration, no sign of the chronic lesion had been further perceived. Upon examination of the painful area, a tumefaction was found in the maxillary bone near the zygomatic arch, involving the lower portion of the temporal region and the temporo-mandibular articulation. Upon palpation it was discovered that the malar bone and the zygomatic arch on the affected side were decidedly thickened.

In view of the data furnished by the clinical history of the patient, of a total absence of organic lesion and of an almost normal urine, the diagnosis of syphilitic manifestation was reached, and subsequently confirmed by the rapid amelioration of all the symptoms, and complete recovery following a mixed specific treatment.

[*Therapeutic Gazette*, Philadelphia, February 15, 1907.]

MOUTH-DISINFECTION. (EDITORIAL.)

The *Therapeutic Gazette* called attention several years ago to the necessity of paying due attention to the condition of the mouth prior to the administration of ether or chloroform for the production of surgical anesthesia, pointing out that the pulmonary complications which follow the use of these drugs on certain occasions are chiefly due to the inhalation of pathogenic micro-organisms which when in the mouth are incapable of much harm, but which in the lung create severe disease. When it is considered that the pneumococcus is found in nearly every so-called healthy mouth, and that many other organisms are associated with it, it is rather remarkable that pulmonary infections are as rare as they are. An interesting research to determine the best methods of disinfecting the mouth, particularly in reference to pneumonia, has been published in the *Journal of Infectious Diseases*, October 30, 1906, by Wadsworth.

He used a considerable number of substances as mouth-washes, and made culture experiments from the mouth to determine the bactericidal value of his measures. It is interesting to note that in his experience most of the mixtures or substances used at the present time as mouth-washes possess very little if any true disinfectant or germicidal power, whereas normal salt solution or ordinary alkaline solutions are efficient in destroying pneumococci. He also found that none of the so-called commercial solutions are efficient when tested upon pneumococci under conditions supposed to be most favorable for their action, and that even such active disinfectants as formalin, lysol, and hydrogen dioxide failed to act on the pneumococcus in exudates. It is also interesting to note that alcohol alone of all the antiseptics proved efficient when tested on the pneumococci under all conditions. Again, Wadsworth found that the rapid diffusion of alcoholic solutions was greatly accelerated by the addition of glycerin. In other words, cleansing the mouth with a normal salt solution simply cleanses it, but does not destroy the bacteria, whereas washing the mouth with an alcoholic wash containing 30 per cent. of alcohol actually produces true disinfection, particularly if to the 30 per cent. solution of alcohol in water a small quantity of glycerin and salt is added.

It would seem evident that this investigation possesses great practical importance, since it enables us not only to prepare patients for operation in such a way that pulmonary complications can be largely avoided, but also because it helps us to prevent the spread of acute infectious diseases, such as pneumonia, from one individual to another, the spread being most frequently induced by small particles of sputum laden with the pneumococcus being expelled in coughing or sneezing, and so finding a way to reach healthy individuals. In hospital wards we are learning that epidemics of croupous pneumonia not infrequently arise after the entrance of a single patient suffering from this disease, and Wadsworth's investigations provide us with a most valuable means of prophylaxis.

PERISCOPE.

To Prevent Expansion of Plaster.—If slaked lime is added to boiling water, and the clear liquid decanted for use in mixing plaster of Paris, the plaster will not expand.—P. B. McCULLOUGH, *Dental Brief*.

Aluminum Washers.—Aluminum plate makes washers where you want a close joint. It is better than lead on a vice where you wish to protect what you are gripping.—A. G. KNIGHT, *Commonwealth Dental Review*.

Hydronaphthol as a Pulp-capping.—To avoid the removal of the layer of softened dentin, which, if removed, would probably necessitate the removal of the pulp, mix equal quantities of hydronaphthol and cement, and place as a capping on the layer of decalcified dentin, allowing it to set. Then proceed with the filling. The hydronaphthol arrests bacterial action.—A. W. MCCALL, *Federal Dental Journal*.

Chloroform Water as a Hemostatic.—This is used by Spaak (*Journ. de Méd.*, September 16, 1906), who finds it superior to all other styptics. It acts with marvelous rapidity, has not the slightest disagreeable taste or odor, is not escharotic, is easily obtainable, and can be made as required. It is not unpleasant when applied, and does not interfere with the surgeon in his operations. Spaak recommends a two per cent. simple solution in water.—*Medical Times*.

Three Useful Pointers.—To take vulcanized rubber from teeth taken off plates.—Place teeth in a small, wide-mouthed bottle containing chloroform, over night. The rubber may be removed as easily as so much charred cork.

To keep hypodermic needle always ready for use. After using, unscrew the needle from the syringe, and blow out any liquid that may be in it. Place a drop or two of alcohol in the large end, and force it through with breath pressure. Use no wire, and do not connect the needle with the syringe until wanted. When so treated, the needle will not clog.

Handy and tough broaches may be made by filing fine piano wire to proper size. Taper

by leaving the broach four-cornered. Such a broach may be used for reaming out the smallest nerve-canal without danger of breaking the broach. Different sizes may always be kept on hand. For posterior canals where the holder cannot be used, a knob may be put on the end with a little soft solder, using zinc chlorid. This is convenient in rotating between finger and thumb to enlarge canals. Piano wire may be obtained from any piano tuner.—J. WYCLIFFE MARSHALL.

To Hasten the Solution of Gutta-percha in Chloroform.—Chloro-percha becomes un-serviceable now and then when it is much needed, because of loss of chloroform through evaporation. To get it into shape again for immediate use, add the solvent and immerse the container in a dish of hot water. The chloroform begins to boil forthwith, and the material is ready for immediate application.—*Dental Office and Laboratory*.

Putrescent Pulp.—I have found the following formula convenient in treating putrescent pulps:

℞—Thymol,
Menthol, āā gr. xxv.
Mix until liquefied.

In treating cases of odontalgia the following has been successful:

℞—Chloral hydrate,
Camphor, āā gr. xx.
Mix until liquefied.

—C. E. ABSTEIN, *Dental Review*.

Sterilization of Engine Handpieces.—Dr. Viggo Andresen of Copenhagen, Denmark, recommends for the sterilizing of engine handpieces and other instruments the heating of them in paraffin oil to a temperature sufficient to destroy all bacterial vitality in connection therewith. Dr. Andresen states that steel instruments, as well as vulcanized attachments thereto, can stand heating up to 150° C. without unpleasant results. The method suggested has the advantage of causing no injury to the surface of the steel by oxidation or corrosion, as when water or aqueous solutions of various antiseptic agents are employed for this purpose.

Application of Silver Nitrate.—Silver nitrate should be employed with a great deal of care. We should not use it in very deep cavities where there is danger of irritation of the pulp. It is in the beginning of caries of the teeth that it is especially useful. I crush a crystal of silver nitrate on the glass slide used for mixing cement, and put a drop of water on it; stir it for a moment, then touch the end of a toothpick to it and carry it to the cavity with that, having first dried the cavity. If possible, let this application dry in the sun, and within fifteen minutes the silver will be precipitated and will become black; if not so at the first sitting, repeat from time to time until a thoroughly black surface results.—G. V. BLACK, *Dental Review*.

A Method of Handling and Sterilizing Root-canal Broaches.—To begin with, broaches come into our hands through the retailer, who, in his turn, gets them from the manufacturer, and neither of these knows or cares much about the sterility of the broach. We are all familiar with the usual manner in which the broaches are put up—six in each flat package, each broach in its respective groove, and all held in place by a narrow strip of paper pasted across the whole six, the entire width of the package. Did you ever watch an average practitioner open a new package of broaches, and pull an individual broach from the package when needed? Almost invariably, I dare say, he takes hold of the smooth end of the broach and pulls it out against the barbs, thus not only dulling these fine barbs and practically destroying their efficiency, but also gathering on them a quantity of paper. An examination under the microscope shows how effectively this adherent paper serves to stop up the grooves, and so to shorten the lengths of individual barbs. These foreign particles we are often able to see with the naked eye; but being unable to remove them without destroying the sharpness of barbs, we let it go at that, many times introducing and leaving such foreign particles within the canals. Of course, to remove the strip of paper that holds the broaches in the package and lift out each broach with a foil-carrier, taking hold of each of them a little back of the beginning of the barbs, would be the better way; but here, again, we get into trouble—the other broaches fall out and scatter here and there, gather dirt, and dull the barbs. The question seems to resolve itself into just one thing; we must have some closed receptacle into which we can place the broaches after having carefully lifted them out of their beds in the broach package. They must be kept in this recep-

tacle, clean and without deterioration, and must not be uncovered except when needed. To this end I have succeeded, to my own satisfaction, in devising the following scheme, which I offer to the profession as a better one than that of boiling the broaches, or any other method of sterilization I have ever attempted or of which I have heard. This method certainly does not destroy the sharpness of the barbs, nor does it impair their temper—both very essential qualities in a broach. Select two wide-mouthed bottles with interchangeable ground-glass stoppers, one of which should have a flat top and a hollow inside. Into the hollow stopper fit a cork tightly, and use a vulcanite file to trim the diametrical excess. Open two or more packages of broaches, lift out each broach carefully from its bed as suggested before, and push each into place in the cork. Have the barbed ends reach to as nearly as possible the same horizontal plane. Then pour in the bottle enough carbolic acid to just cover the barbs nicely, and label the bottle. Into the second bottle pour a quantity of absolute alcohol. When the broaches are needed, take out the stopper with broaches from the carbolic acid bottle, and transfer it to the alcohol bottle. Shake a minute or so to neutralize the action of the carbolic acid, and the broaches can then be used with the assurance that there is nothing on them that might be apt to give trouble. The advantage of a flat base in a glass stopper is obvious; it can be set down on the bracket table, and it will not roll about. Replace the empty punctures in the cork with new broaches, and again immerse the whole in the phenol bottle for further use. When the phenol discolors, showing signs of deterioration from age and exposure to light, change it for a fresh quantity, and be sure to keep it in the dark corner of your medicine cabinet.—GEORGE ZEDERBAUM, *Dental Brief*.

Care in the Use of Silver Nitrate.—In the use of a strong solution of silver nitrate it is necessary to neutralize any of the solution which escapes from the confines of the area intended for its reception, for silver nitrate solutions, except the very weak ones, are escharotic. For that purpose I am in the habit of flushing out the mouth with a solution of common salt, say fifty per cent., but almost any strength will do. In that way insoluble silver chlorid is formed. Silver chlorid when dry has a sandy consistence, so that it should be well washed out of a cavity. For erosions or exposed surfaces where the action of the silver nitrate must be limited,

I am in the habit of using the stick, or "lunar caustic."

Another combination of silver nitrate is that with iodine, forming the insoluble, soothing silver iodide. This is done by first applying tincture of iodine liberally over the gums and about the teeth, but not in the cavities, for the teeth will become discolored; then apply about ten per cent. silver nitrate solution immediately on a small swab, and follow this with some more iodine, which prevents any free silver nitrate remaining, and although there is a surplus of tincture of iodine, it may be quickly washed out, and is at the worst merely irritating. This application I use frequently, especially after cleansing the teeth, and in the treatment of all infectious conditions of the gums and oral cavity.—OTTO HOLINGER, *Dental Review*.

Cavity Preparation for Inlays Subject to Stress.—In the preparation of a cavity for an inlay which will be subject to stress of mastication, we must ever keep in mind that the inlay must be retained primarily by the mechanical relation between tooth and inlay. This should be laid down as a basic principle, and can be accomplished only by a close study of the direction and amount of force to which the inlay will be subjected. No one set rule for cavity preparation will serve for all cases, but in many instances the method of procedure must be left to the best judgment of the operator. Since so many similar cavities occur, however, under similar conditions, a few general rules may be given which in the main would be safe to follow. In all classes of cavities the general form should be such that when the greatest stress of mastication is brought to bear upon the inlay, it will be met in the cavity by sufficient mechanical resistance to prevent its dislodgment. When this form of cavity is secured, that stress will tend to more firmly lock the inlay in the tooth. The theory of "extension for prevention" must be observed, but since gold inlays are especially applicable to extensive cavities, this principle is necessarily carried out in all such cases. In general, the cavity preparation should be much the same as for a gold filling, with certain exceptions. All undercuts and perpendicular walls should be avoided, and the axial walls should form a slightly obtuse angle with the pulpal walls and the seat of the cavity. This technique does not necessitate the beveling of the enamel margins, as the enamel rods at the margins will then be supported by sound dentin. If the margin of a cavity is in close proximity to the summit of a cusp, it should be carried

well beyond that point, to admit of a sufficient bulk of gold to withstand the stress likely to be brought upon it, and thus protect the enamel margin. This can be accomplished nicely by the use of suitable stones and sandpaper disks. In approximo-occlusal cavities the occlusal portion of the cavity should be carried well over that surface of the tooth, to allow a decided dovetailing into a strong portion of tooth-structure. Too great stress cannot be laid upon occlusal retention for such inlays. It is the only reliable retention in this class of cavities, and yet in many instances it is, by some operators, entirely overlooked. The angle formed by an approximo-occlusal margin should be well rounded by means of stones and sandpaper disks, as this is a point on the cavity margin liable to fracture under stress of mastication, if left unprotected. The angle of the step should be strictly rounded to facilitate the adaptation of the matrix. All the peripheral margins should be nicely polished with sharp burs, Arkansas stones, and fine disks, until a smooth, clean-cut outline is presented.—W. D. N. MOORE, *Dental Review*.

The Cement Line of Inlays: Permanence Dependent upon Minimum Thickness.—When an inlayed filling is made to perfectly fit a cavity (which is quite possible) and is properly cemented to place, the cavity is so sealed that a leaky condition such as occurs about an ordinary metal filling is impossible. The permanence of a cement line about an inlay is dependent to a great extent on its minimum thickness, both for strength of adhesion and diminished tendency to wear away. Comparing this cement joint to the wood-joiner's glue joint, the minimum amount gives the maximum strength, and it must be remembered, too, that cement is much stronger than glue. The closer the inlay fits against the walls and margins of a cavity, the less cement is exposed, and in consequence there is less to wear and wash away. The way that cement wears (cupping out) when used alone as a filling, allows of certain comparisons. It has been my observation that cement wears out, from the margin of an inlay, only as deep as the margin is wide, and no deeper. I consider this, if correct, a very important fact in inlay work. So I repeat, if an inlay is made to come in close contact with cavity walls and margins, there is practically no cement to waste away, and if it does wear it is only to a depth as great as the margin is wide. This explains to me one of the principal reasons why inlayed fillings

are less subject to recurrent caries.—S. J. KNOWLES, *Dental Review*.

Method of Mixing Cement.—There should be just enough powder added in small portions to the liquid, thoroughly spatulating each portion, until a homogeneous mass is formed. For fillings it is best to mix it as stiff as possible; for crowns, bridges, and inlays, as stiff as will permit of the piece going to place. Too little spatulation gives a quick-setting, granular result, and over-spatulation gives a cement which will never properly crystallize. All cements have their peculiarities, and before any one is used a perfect comprehension should be had of all its peculiarities by experimentation out of the mouth. The method of incorporating as much powder as possible in an effort to produce a very stiff or putty-like mix that can be kneaded between the fingers is to be condemned, not only from the fact that an imperfect mix is obtained, but also because the water of crystallization will be absorbed during contact with the fingers.

In mixing cements I have found a large porcelain slab, in combination with a large, thick, almost convex-shaped metal spatula, best adapted for the purpose. The slab and spatula should be immaculately clean before commencing to mix, if for no other reason than the fact that one crystal of a kind will hasten the formation of other crystals, thereby in the end ruining or very much impairing the usefulness of the cement after mixing.—ROBERT HOMER WELSH, *Items of Interest*.

Successful Partial Lower Dentures.—

In the application of partial lower dentures much possible injury may be easily avoided, and a hygienic and satisfactory result obtained by a modern type of construction. This embraces the use of a wire of clasp metal, or iridio-platinum, of No. 12 to 14 gage, adapted to conform to the outline of the anterior part of the arch at a point well down toward the floor of the mouth. Where the bases are of gold or platinum, the ends of the wire should first be flattened on the anvil, bent to come in contact with them, and then securely soldered thereto; while if vulcanite is to be used, it is only necessary to flatten and notch the surplus end, and to have it sufficiently long to insure adequate attachment, and thus preclude the possibility of subsequent loosening. If clasps be used, they should be first soldered to the wire, using an extension of the same size wire for

this purpose; a single anterior tooth may also be supported in the same manner. Such a type of construction—whether used in conjunction with clasps or not, and whether the case be made of platinum and porcelain, gold, or aluminum with vulcanite attachments, or simply of vulcanite alone—does not materially increase the length of time required to construct the denture or the expense involved, but will be productive of results which will be difficult to obtain in any other manner, and which will be appreciated by the wearer from the very beginning to the very end of its usefulness.—HART J. GOSLEE, *Western Dental Journal*.

Contraction and Expansion of Plaster of Paris.—

When dental plaster of a good quality and water are mixed in proper proportions, re-crystallization or setting usually begins in from two to six minutes. At the initial stage of the setting process a very slight amount of contraction is noticeable; then follows a short period of inertia lasting a minute or two, after which expansion sets in. The expansion begins slowly, then increases rapidly, until in about four or five minutes the maximum rate of movement is reached, when it gradually decreases, and is apparently over in about twenty minutes from the time of making the mix. As a matter of fact, expansion to a limited extent continues for twenty-four hours, or even a longer time, with no perceptible contraction following. During the setting process a rise of about ten degrees in temperature in the mass is noticeable. Considerable difference of opinion exists as to the percentage of expansion which ordinarily occurs. Dr. Stewart J. Spence states that the average is about one per cent., while in the experiments I conducted, the average was about one-fourth of one per cent. Without doubt the difference noted can be partially accounted for by the difference in manipulation.

In the experiments alluded to, an effort was made to subject the material to the same treatment it ordinarily receives in the dental laboratory. No attempt was made to induce abnormal movement, which could easily have been brought about by long-continued and rapid stirring, and I am therefore of the opinion that my own estimate is more nearly correct. The fact remains, however, that all plasters expand, whether much or little, and that this movement, even under the most favorable conditions, results in enlarged and frequently warped molds.—J. H. PROTHERO, *Dental Register*.

OBITUARY.

DR. LUTHER W. SKIDMORE.

DIED, at Moline, Ill., February 23, 1906, DR. LUTHER W. SKIDMORE, in the forty-third year of his age.

Dr. Luther W. Skidmore was born in Morris, Ill., June 2, 1863. At nineteen years of age he entered the Dental Department of the Pennsylvania University, and was graduated in 1884. The following January, 1885, he commenced the practice of dentistry in Moline, Ill., and for twenty-one years has maintained a reputation and example which is well worthy of being followed by anyone, young or old, within or out of the dental profession.

Dr. Skidmore was closely identified with the Illinois State Dental Society, the First District Society of Illinois, the Tri-City Dental Society, and the Rock Island County Dental Society, and was actively and energetically engaged in every effort toward the success and welfare of each society above mentioned. He served as president of nearly all, and was recently elected vice-president of the Illinois State Dental Society.

Dr. Skidmore was genial of disposition, kindly of heart, and ever ready to help his fellow men, qualities which won for him a large circle of friends. He was a member of several secret organizations.

He is survived by his mother—Mrs. D. Hall Skidmore; his brothers—Dr. Wallace G. Skidmore now of Minneapolis, and Byron G. Skidmore of Moline, Ill., and his daughter Alice.

RESOLUTIONS OF REGRET.

Out of respect to the memory of Dr. Skidmore, the Rock Island County Dental Society adopted the following resolutions, February 27, 1906:

Whereas, The hand of Providence has removed from our midst our honored brother in the profession, Dr. L. W. Skidmore; and

Whereas, In his death we have lost one of our most active members, who until his death evinced a warm interest in the welfare of our

association; and who as a member of the various societies of the state gave freely of his time and energy for their betterment and advancement; therefore be it

RESOLVED, That we, the members of the Rock Island County Dental Society, desire to and do express to his family our sympathy and sorrow in their affliction, and our admiration for the professional and personal qualities of our member, who was our friend, ever ready to extend a helping hand to a brother: and be it

RESOLVED, That these resolutions be spread upon the records of our association, a copy be sent to the family of our departed brother, and others to the dental journals for publication.

W. T. MAGILL,
W. G. HAY,
H. G. TRENT,
Committee.

DR. SIDNEY L. GEER.

DIED, following a surgical operation at his home in the Geer block, Norwich, Conn., on Wednesday, April 18, 1906, DR. SIDNEY L. GEER, in the sixty-eighth year of his age.

Dr. Sidney L. Geer was one of the best known practitioners of dentistry in eastern Connecticut. He was born in Scotland, Conn., September 17, 1838, and was the son of Jephthah and Olive Starkweather Geer. He attended the public schools of his native town, and in 1855, when seventeen years of age, went to Norwich to learn the profession of dentistry under the preceptorship of Dr. E. K. Cook, who in 1858 went to South America, where he located and practiced and died. Dr. Geer succeeded Dr. Cook in the practice of dentistry, and has remained there ever since, having lived in Norwich for over half a century. Dr. Geer was an advertiser in the first issue of the *Norwich Bulletin*. He built up an extensive practice, owing to his professional skill and pleasing disposition. Dr. Geer, in 1877, erected a fine brick block on Broadway, where he spent his last years.

Dr. Geer was a staunch republican and for eight years was a member of the board of

water commissioners, being chairman of the board for four years. In the water department he was always deeply interested, and also in every public matter which came up in Norwich.

He was a man with the courage of his convictions and was held in the highest esteem by his many friends. He possessed a pleasant, jovial disposition, was kind-hearted and liberal, and will be greatly missed. He was a man whose opinion was sought on many subjects and his advice was sound and practical.

He married Harriet Perry, in Norwich, July 20, 1865, and she died March 15, 1898. Dr. Geer's only brother, Henry B. Geer, died April 18, 1900.

DR. JACOB LAFAYETTE WILLIAMS.

DIED, at his home, No. 4 Walnut st., Boston, Mass., May 15, 1906, JACOB LAFAYETTE WILLIAMS, M.D., in his eighty-third year.

Dr. Williams was born at Mansfield, Mass., March 16, 1824. He was the son of Jacob and Ada (Perry) Williams, and in his youth had lived for some years in the family of his uncle, Dr. William Perry, with whom he later studied medicine. After completing a literary course at Brown University, he matriculated in the medical school of Harvard University, from which institution he was graduated with the degree of M.D. in 1848. Later, he specialized in dentistry, and achieved marked distinction for his professional skill and ability to successfully fulfill the arduous duties of an extensive practice.

Dr. Williams was a philanthropist who gave freely of his means for the support of all worthy objects brought to his attention. Professionally, he displayed intense interest in all matters pertaining to his chosen specialty, holding active membership in the National Dental Association, the American Academy of Dental Science, the National Dental Association, the American Medical Association, the Massachusetts Medical Society, and

the Society for the Advancement of Oral Science.

DR. WILLIAM TELL LAROCHE.

DIED, at Harrington Park, New Jersey, February 8, 1906, WILLIAM TELL LAROCHE, D.D.S., in the eighty-third year of his age.

Dr. LaRoche was born at Frenchtown, N. J., July 30, 1822. He started upon the study of dentistry unassisted, and by studying at night acquired a good share of the dental knowledge available at that period. He started in practice in New York city in about 1840, opening an office in Bleeker st. Later on he studied in the New York College of Dentistry, receiving from that school the D.D.S. degree. He was a member of the First District Dental Society of the State of New York, of the Alumni Society of the New York College of Dentistry, and an ex-president of the Board of Trustees of his alma mater.

DR. JEROME PLUMMER TRIPP.

DIED, of pneumonia, at his home, 17 Lincoln st., New Bedford, Mass., January 8, 1907, JEROME PLUMMER TRIPP, D.D.S., in the thirty-eighth year of his age.

Dr. Tripp was born at Rochester, Mass., November 26, 1869, and entered upon the study of dentistry in January 1893, under the tutorship of Drs. E. V. McLeod and A. L. Shockley. He later on became a student at the Boston Dental College, receiving the D.D.S. degree in 1896. Dr. Tripp was a member of the Massachusetts Dental Society and of Psi Omega Dental Fraternity.

An estimable man, of high professional ideals, of unimpeachable moral character, of genial temperament, and self-sacrificing tendencies, the community in which he lived mourns the loss of one who completely fulfilled all the requisites of exemplary citizenship.

Dr. Tripp is survived by his widow and two children.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

April, May, and June, 1907.

APRIL.

CONNECTICUT STATE DENTAL ASSOCIATION. New London. Two days: April 16th and 17th.

FIFTH DISTRICT (NEW YORK) DENTAL SOCIETY. Syracuse. Two days: April 9th and 10th.

MONTANA STATE DENTAL SOCIETY. Helena. Two days: April 12th and 13th.

MAY.

ALABAMA DENTAL ASSOCIATION. Birmingham. Four days: May 14th to 17th.

ARKANSAS STATE DENTAL ASSOCIATION. Eureka Springs. Three days: May 29th to 31st.

EASTERN INDIANA DENTAL ASSOCIATION. Anderson. Two days: May 14th and 15th.

GEORGIA STATE DENTAL SOCIETY. Atlanta. Four days: May 7th to 10th.

ILLINOIS STATE DENTAL SOCIETY. Quincy. Four days: May 14th to 17th.

IOWA STATE DENTAL SOCIETY. Cedar Rapids. Three days: May 7th to 9th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: May 20th to 22d.

LAKE ERIE DENTAL ASSOCIATION. Cambridge Springs. Three days: May 21st to 23d.

MISSISSIPPI DENTAL ASSOCIATION. Meridian. Three days: May 28th to 30th.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 10th and 11th.

OREGON STATE DENTAL ASSOCIATION. Portland. Three days: May 9th to 11th.

SOUTH DAKOTA STATE DENTAL SOCIETY. Sioux Falls. Three days: June 5th to 7th.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION. Los Angeles. Three days: May 6th to 8th.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Lancaster. Three days: May 21st to 23d.

VERMONT STATE DENTAL SOCIETY. Burlington. Three days: May 15th to 17th.

JUNE.

COLORADO STATE DENTAL SOCIETY. Colorado Springs. Three days: June 20th to 22d.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 11th to 13th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Three days: June 5th to 7th.

NEW HAMPSHIRE DENTAL SOCIETY. Plymouth. Three days: June 25th to 27th.

SOUTH DAKOTA DENTAL SOCIETY. Sioux Falls. Three days: June 5th to 7th.

TEXAS STATE DENTAL ASSOCIATION. San Antonio. Three days: June 13th to 15th.

Examiners' Meetings.

ALABAMA BOARD OF EXAMINERS. Birmingham. May 13th.

ARIZONA BOARD OF EXAMINERS. Phenix. April 8th to 10th.

ARKANSAS BOARD OF EXAMINERS. Eureka Springs. May 27th and 28th.

CALIFORNIA BOARD OF EXAMINERS. Los Angeles, June 10th; San Francisco, June 17th.

CONNECTICUT DENTAL COMMISSIONERS. Hartford. June 13th to 15th.

ILLINOIS BOARD OF EXAMINERS. Chicago. June 3d.

INDIANA BOARD OF DENTAL EXAMINERS. Indianapolis. June 11th to 13th.

IOWA BOARD OF DENTAL EXAMINERS. Iowa City. June 6th to 11th.

MARYLAND BOARD OF DENTAL EXAMINERS. Baltimore. May 22d and 23d.

MINNESOTA BOARD OF EXAMINERS. Minneapolis. April 2d to 4th.

NEBRASKA BOARD OF EXAMINERS. Lincoln. May 29th to 31st.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 11th to 13th.

TEXAS BOARD OF EXAMINERS. San Antonio. June 10th.

WEST VIRGINIA BOARD OF EXAMINERS. Wheeling. June 12th to 14th.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next meeting of the *Fédération Dentaire Internationale*, to be held at Amsterdam on August 8 and 9, 1907, promises to be one of exceptional interest, as a number of questions of great importance to the federation, as well as to the whole dental profession, must receive a thorough consideration at this time.

Our experience has brought out a number of points in the rules and regulations which require to be cleared up. The question of a pamphlet containing specific directions for the care of the teeth, presented in a form adapted to widest circulation among the poor, is also to receive its final settlement at Amsterdam.

Particular attention will be devoted to a matter which after a period of comparative quiet is again agitating the minds of dental teachers and practitioners, and which concerns the education which in future should be demanded of the dentist. The question whether the dentist should above all things be a full graduate in medicine, with a knowledge, more or less complete, of dentistry superadded, or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make on him, is one which the F. D. I. has already pronounced upon in its session at Stockholm in August 1902. It cannot, however, be considered as having been definitely disposed of. It is, on the contrary, perhaps more acute at present than at any previous period in the history of our professional development.

The position of the F. D. I. having become more firmly established and its vote more authoritative, it is very desirable that its opinion should again be heard on this most important question, and every member should come prepared to give definite expression to his views.

Another point to be dealt with relates to the action of the committee of organization of the next international medical congress to be held in Budapest in 1909, in excluding from participation dentists who do not possess the medical degree. A consideration of

the right and duties of the F. D. I. in connection with the international dental congress to be held in Berlin in the same year will also take up some of the time.

These are a few of the matters which require special attention, and I sincerely hope that members will make every possible effort to be present. The steps taken toward the founding of an intellectual world-center at the Hague, if realized—and there seems to be every reason for trusting that such will be the case—will give an impulse to internationalism which will add greatly to the significance and importance of the F. D. I., and the hopes that it will be able to accomplish much in the interest of our profession and of humanity at large seem nearer fulfillment now than ever before.

W. D. MILLER, *President*.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

The Jamestown Dental Convention, to be held under the auspices of the Jamestown Exposition Company, the Southern Branch of the N. D. A., and the Virginia State Dental Association, will convene at Norfolk, Va., September 10 to 12, 1907. The Jamestown Exposition Company have appointed the above named gentlemen as a Committee on Organization, to elect officers in advance of the meeting, to appoint all committees, to finance the meeting, and to bring it to a successful termination.

The Committee on Organization have appointed Dr. Clarence J. Grievess, Baltimore, Md., general chairman of the Clinic Committee and Supervisor of Clinics.

A number of well-known men will assist him on the General Committee. State clinic chairmen have been selected from every state in the Union. The clinics are to be the principal feature of the convention, and it is expected to bring about the largest and most instructive dental clinics ever held. A surgical clinic will also be held under the supervision of Dr. L. M. Cowardin, Richmond, Va. The other members of this committee are J. Y. Crawford, Nashville, Tenn., and A. G. Friedrichs, New Orleans, La. Dr. F. W. Stiff, Richmond, Va., is general chairman of the Membership Committee.

Assistant state chairmen have been appointed from every state in the Union. Already membership fees are being sent in, and the promise is for the largest gathering of dentists ever held. Only five essays will be read at the convention, one by Prof. W. D. Miller, another by Prof. G. V. Black, and the other three by well-known southern dentists.

Several exhibits of much interest to the profession will be held under the auspices of the convention; among them the dental manufacture exhibit in charge of Dr. John W. Manning, chairman, Norfolk, Va.; a comparative anatomy exhibit, in charge of Dr. W. M. Bebb, chairman, Los Angeles, Cal., which exhibit will consist of three thousand comparative anatomy specimens, and also numerous other collections of interest; a dental historical exhibit, consisting of ancient instruments, operative and prosthetic work, books and photographs, under the chairmanship of Dr. Wm. H. Trueman, Philadelphia, Pa.; the orthodontia exhibit, showing a large collection of models, etc., under the chairmanship of Dr. H. E. Kelsey, Baltimore, Md. The U. S. Naval dental exhibit, showing 3000 charts of the mouths of midshipmen, will be under the chairmanship of Dr. Richard Grady, the U. S. dental surgeon of Annapolis, Md. The exhibit of the U. S. Army Dental Corps, under the chairmanship of Dr. John S. Marshall, San Francisco, Cal., will also show the equipment, method of keeping records, etc., used by the dental corps.

A full list of the various officers, who are to be elected in advance by the Committee on Organization at their next meeting in February 1907, and of the committees, will appear in due time in the various dental journals. The Committee of Organization is expected to

select officers in advance in order that the officers may be prepared for their duties before the actual meeting of the convention.

A cordial invitation is extended to all reputable members of the profession to become members of this convention, and to assist the Committee on Organization in bringing about one of the best, if not the best, dental meeting ever held.

The Exposition itself offers an excellent opportunity for the busy practitioner to take a delightful vacation, see the wonderful historical and naval and military exhibits at the Exposition, and also to participate in this meeting. The membership fee, which is \$5.00, should be sent to Dr. F. W. Stiff, treasurer, 600 East Grace st., Richmond, Va.

For further information address

H. W. CAMPBELL, Sec'y,
Suffolk, Va.

SOUTHERN BRANCH, N. D. A.

NOTICE TO MEMBERS.

I HAVE several copies of the N. D. A. Transactions for 1904-05, and will be glad to send one, as long as they last, to anyone entitled to a copy and who has not received one.

B. D. BRABSON,
Knoxville, Tenn.

NATIONAL DENTAL ASSOCIATION.

ANNOUNCEMENT OF CLINIC.

THE work of arranging the clinical operations, table clinics, etc., for the coming N. D. A. meeting, is progressing. I had hoped that I might at this time publish the names of the district and state chairmen, but that is impossible. The fearful floods and the great amount of snow which has fallen have prevented the usual mail facilities. It must be this, for the letters sent December 20, 1906, in many cases still remain unanswered.

Plans have been made, which if followed, should result in bringing to the meeting men from all the states in the Union and Canada.

As soon as possible each state will be provided with a local chairman, who will make every effort to obtain such an array of talent that the clinic of the National Dental Association—which is to be held at Minneapolis on July 31st and August 1st—may be the

best ever arranged for the consideration of the members.

The work of the clinic has been divided. W. N. Murray, Medical block, Minneapolis, has been appointed chairman of the Inlay Section. Dr. Murray is arranging special features for his department. Dr. W. R. Clack of Clear Lake, Iowa, the secretary of the Clinic Section, has the territory west of the Mississippi river entirely under his jurisdiction. I have the rest of the United States and Eastern Canada under my care.

The Executive Council has invited the members and friends of the G. V. Black Dental Club to operate on one of the days of the clinic. The invitation will be extended to them, and beyond a doubt it will be accepted.

The fact that I have been chosen chairman of the Clinic Section does not mean that the clinic is to be a "Black Club" clinic. It simply means this—that I hereby extend a most cordial invitation to all reputable dentists in the United States and Canada to come, meet with us, and if you have anything new to introduce in methods of filling teeth or some new appliance you wish to demonstrate at a table clinic, come to us and be welcome. Every chance will be given all to assist in making this a most memorable clinic. (I am not in position to invite to the clinic those who have patented instruments or methods to sell—their place is the exhibit room.)

I would like every man who has anything which he feels is of value to others, to know that if he will come and demonstrate it, there is room on the program and at the meeting for him.

I am depending upon the district and state chairman to assist me. One man may do much, but many men who are willing to work, and who do work, are able to do much more. I am bending every energy to making this clinic the best which the National has ever held. More no man is able to do.

The dental journals for July will contain the clinical program. Those who wish their names to appear as operators or table clinicians must have them in my hands by June 1st, as on July 1st the N. D. A. program goes to the printer.

E. K. WEDELSTAEDT, *Ch'man Clinic Section,*
New York Life bldg., St. Paul, Minn.

VOL. XLIX.—32

A PUBLIC DENTAL LIBRARY For Columbus, Ohio.

THE Trustees of the new Columbus Carnegie Library Building, a handsome structure costing \$250,000, have set apart a room 40 by 60 feet for the exclusive use of a Dental and Medical Library.

The local dentists have organized a Dental Library Association for the express purpose of bringing this matter to a successful issue, and the work thus far accomplished far exceeds our expectations. The Columbus dentists alone have donated \$500 in cash and a number of books and magazines.

To make this library complete in embracing all known works pertaining to our specialty and complete files of all the journals published, we desire the co-operation of every dentist in the state. Any old and rare works, copies of old journals, etc., will be gratefully received, inscribed with the name of the donor, and recorded to his credit in the library catalog. Please communicate with us concerning any literature you may have that you can donate to this cause, giving titles and authors of books; names and dates of journals, etc. In case of duplication they will be valuable for exchange with other libraries.

W. H. TODD, *Pres.*,
190 S. High st.
EDWARD C. MILLS, *Sec'y*,
10 Y. M. C. A. bldg.

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompret, general secretary; Dr. Girce, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Subscriptions and communications should be addressed to

DR. CHOMPRET, *General Sec'y*,
182 rue de Rivoli, Paris.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the European plan. Any room in the hotel is capable of accommodating two people. All the rooms have telephone connection, and hot and cold water. Railroad rates will be given later.

The Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,
29 Fulton st., Newark, N. J.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE forty-third annual convention of the Connecticut State Dental Association will be held at New London, Conn., Tuesday and Wednesday, April 16 and 17, 1907. The following essays will be presented:

Dr. F. B. Noyes, Chicago, "The Structure of Enamel with Reference to Cavity Preparation."

Dr. H. C. Ferris, Brooklyn, N. Y., "Antiseptic Sprays and Their Physiological Action."

Dr. G. M. Griswold, Hartford, Conn., "Burnished Fillings."

Dr. E. Whitford, Westerly, R. I., "Our Old Stand-by."

Dr. A. J. Flanagan, Springfield, Mass., "Comparisons are Odious."

Dr. F. S. Belyea, Brookline, Mass., "The Artistic Arrangement of Teeth."

E. S. ROSENBLUTH, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in Minneapolis, Minn., commencing at 2 P.M., Friday, July 26, 1907.

The Executive Committee will meet at 10 A.M. the same day. The West Hotel has been selected as headquarters and place of meeting. Hotel rates as published in the notices of the meeting of the National Association of Dental Examiners will prevail.

H. B. TILESTON, *Ch'man Ex. Committee*,
B. HOLLY SMITH, *Sec'y Ex. Committee*,
1007 Madison ave., Baltimore, Md.

MONTANA STATE DENTAL SOCIETY.

A MEETING of the Montana State Dental Society will be held in Helena, April 12 and 13, 1907.

W. E. TREBISSE, *Sec'y*,
Helena, Mont.

FIFTH DISTRICT (N. Y.) DEN- TAL SOCIETY.

THE thirty-ninth annual meeting of the Fifth District Dental Society of the State of New York will be held at the Yates Hotel, Syracuse, N. Y., April 9 and 10, 1907.

C. A. SAYERS, *Rec. Sec'y*.

OREGON STATE DENTAL ASSOCIATION.

AT the last meeting of the Executive Committee of the Oregon State Dental Association, it was decided to hold the annual meeting in Portland, Ore., May 9, 10, and 11, 1907.

JEAN CLINE, *Sec'y-Treasurer*,
Portland, Ore.

SOUTHERN WISCONSIN DEN- TAL ASSOCIATION.

THE thirteenth annual meeting of the Southern Wisconsin Dental Association will be held at Lancaster, Wis., May 21, 22, and 23, 1907. All reputable practitioners are cordially invited.

C. W. COLLVER, *Sec'y*,
Clinton, Wis.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association will hold its annual meeting at Eureka Springs, Ark., May 29, 30, and 31, 1907.

HENRY P. HOPKINS, *Sec'y-Treas.*,
Argenta, Ark.

EASTERN INDIANA DENTAL ASSOCIATION.

THE Eastern Indiana Dental Association will meet in Anderson, Ind., May 14 and 15, 1907. Good clinics, good papers. Everybody invited. Everybody who comes is a member.

C. W. ORLAND,
Anderson, Ind.

ILLINOIS STATE DENTAL SOCIETY.

THE forty-third annual meeting of the Illinois State Dental Society will be held at Quincy, on Tuesday, Wednesday, Thursday, and Friday, May 14, 15, 16, and 17, 1907.

ARTHUR D. BLACK, *Sec'y*,
31 Washington st., Chicago.

KENTUCKY STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21, and 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession.

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE tenth annual session of the Southern California Dental Association will be held in Los Angeles, May 6, 7, and 8, 1907, at the same time that the Imperial Council of Mystic Shrine meets here, and all members of the dental profession contemplating visiting southern California at that time will confer a favor upon the association by notifying

CHAS. M. BENEBROOK, *Sec'y*,
455 S. Broadway, Los Angeles, Cal.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the New York State Dental Society will be held at Hotel Ten Eyck, Albany, May 10 and 11, 1907, convening promptly at 10 o'clock on the morning of the first day, at which time the president desires to see every member present. A program of reports and essays of unusual interest will be presented, and on Saturday afternoon a large number of special chair and table clinics will be given. A cordial invitation is extended to all reputable practitioners to attend the sessions.

PROGRAM.

Dr. W. A. White, President's Address.

Dr. A. H. Peck, Chicago, "The Value of Association."

Dr. Clarence J. Grieves, Baltimore, "The Soldered Porcelain Facing Checked: Causes and Remedies." Illustrated.

Dr. Eugene Talbot, Chicago, "Acid Auto-intoxication and Systemic Diseases the Cause of Erosion and Abrasion."

Dr. L. C. F. Hugo, Washington, "Preparing Dental Papers."

Dr. G. V. I. Brown, Milwaukee, "Oral Surgical Lessons." Illustrated.

Dr. Chas. McManus, Hartford, "Pierre Fauchard." Illustrated.

Dr. Nelson T. Shields, New York city, "Treatment and Filling of Root-canals."

Dr. I. C. Curtis, Fulton, N. Y., "Fifty Years of Dental Science, with its Fads and Foibles."

Dr. S. L. Goldsmith, New York city, Report of the Correspondent.

Dr. E. Howard Babcock, Brooklyn, Report of the Committee on Practice.

Dr. Emanuel Muntz, Buffalo, Report of the Committee on Scientific Research: "Saliva Sulfocyanate Test."

There will be an interesting exhibit of dental appliances and supplies by the leading dealers in the country. For any information regarding exhibits, address Dr. J. L. Appleton, 89 Columbia ave., Albany, N. Y.

A railway rate of a fare and one-third, on the certificate plan, for those attending the meeting will be secured. Tickets at full fare for the going journey may be purchased within three days previous to and during the

first day of the meeting. Be sure, when purchasing ticket, to request a certificate. On arrival at the meeting, present the certificate, with twenty-five cents, to the secretary, Dr. C. S. Butler.

Tickets good returning not later than May 15th.

W. A. WHITE, *President*.
CHAS. S. BUTLER, *Sec'y*,
Buffalo, N. Y.

IOWA STATE DENTAL SOCIETY.

THE forty-fifth annual meeting of the Iowa State Dental Society will be held at Cedar Rapids, Iowa, May 7, 8, and 9, 1907. A good program is being arranged for. A cordial invitation is extended to the profession.

C. L. TOPLIFF, *Sec'y*.
Decorah, Ia.

MISSISSIPPI DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Mississippi Dental Association will convene in the county court-house in Meridian, May 28, 29, and 30, 1907. All ethical practitioners of this and other states are cordially invited to attend. Reduced railroad rates and reduced hotel accommodations will be secured.

For full particulars, address

E. DOUGLAS HOOD, *Sec'y*,
Tupelo, Miss.

WASHINGTON UNIVERSITY DENTAL DEPARTMENT.

MEETING OF ALUMNI.

A MEETING of the Alumni Association of Washington University Dental Department (Missouri Dental College) will be held May 20, and 21, 1907, at the college building, 2645 Locust st., St. Louis, Mo.

A number of prominent essayists and clinicians have been secured, and an interesting and instructive program will be presented. Adequate space has been secured for the various manufacturers' exhibits; this will be a noteworthy feature of the meeting. All ethical practitioners are invited.

A. J. PROSSER, *Chairman*,
F. W. HORSTMANN,
CHAS. HERBERT.

GEORGIA STATE DENTAL SOCIETY.

THE next annual meeting of the Georgia State Dental Society will be held in Atlanta, May 7, 8, 9, and 10, 1907. All ethical practitioners are cordially invited to attend.

D. H. MCNEILL, *Cor. Sec'y*,
Athens, Ga.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in Birmingham, Ala., May 14 to 17, 1907. Reduced rates on all railroads. All ethical dentists are invited to attend.

F. A. JOHNSTON, *Sec'y*,
Sheffield, Ala.

LAKE ERIE DENTAL ASSOCIATION.

THE forty-fourth annual meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., on May 21, 22, and 23, 1907.

Upon our program this year are men of exceptional merit, and we are pleased to invite all reputable dentists and their friends to this beautiful place for convention purposes.

V. H. MCALPIN, *Sec'y*,
Warren, Pa.

ST. LOUIS DENTAL COLLEGE.

ALUMNI CLINIC.

THE Alumni Association of the St. Louis Dental College (formerly Marion-Sims) wish to announce that their annual clinic will be held at the college building, Grand ave. and Caroline st., on Tuesday and Wednesday, May 7 and 8, 1907.

All ethical members of the profession are cordially invited to come and enjoy the festival of good things being prepared, and every member of the alumni is especially requested to show his allegiance to the association by his presence.

JOHN BERNARD O'BRIEN,
W. L. O'NEILL,
Committee on Publicity.

VERMONT STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., May 15, 16, and 17, 1907.

The society has in the past held most successful meetings, and we have every reason to expect that this will surpass any previous one, as a very interesting program has been prepared by the committee, and will be mailed in due time. Vermont has the largest per cent. of membership in its state society of any state in New England, and we hope to see every dentist in the state who is eligible a member.

THOMAS MOUND, *Sec'y*,
Rutland, Vt.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, and 13, 1907. The Executive Committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, *Sec'y*,
Indianapolis, Ind.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its meeting in the city of San Antonio, June 13, 14, and 15, 1907.

G. W. STAPLES, *Sec'y*.

SOUTH DAKOTA DENTAL SOCIETY.

THE twenty-fifth annual meeting of the South Dakota Dental Society will be held at Sioux Falls, June 5, 6, and 7, 1907.

A most interesting program has been arranged, and we want to see the largest attendance the society has ever had. A larger membership is desired, and every eligible dentist in the state should become a member. A special invitation is extended to South-eastern Minnesota and Northwestern Iowa dentists to attend.

FERDINAND BROWN, *Sec'y*,
Sioux Falls.

COLORADO STATE DENTAL SOCIETY.

THE annual meeting of the Colorado State Dental Society will be held at Colorado Springs, June 20, 21, and 22, 1907. A good program is being arranged and a profitable meeting is assured. An invitation to attend is extended to all ethical dentists, and special efforts will be put forth to make it pleasant for visitors from other states.

The undersigned would be pleased to hear from any who may plan to attend the meeting.

I. C. BROWNLIE, *Ch'm Exec. Com.*,
404 California bldg., Denver, Colo.

MASSACHUSETTS DENTAL SOCIETY.

THE forty-third annual meeting of the Massachusetts Dental Society will be held in the Mechanic Association bldg., Huntington ave., Boston, Mass., June 5, 6, and 7, 1907.

An excellent program has been arranged by the Executive Committee. It will consist of essays, reports of special committees, clinics, and a large exhibit of dental and medical supplies. Special committees will report on the following interesting subjects: Tuberculosis and other preventable diseases, dental education, dental supplies, dental medicine, dental research, and dental hospitals. Gentlemen practicing dentistry in the state of Massachusetts are invited to join the society.

CHARLES W. RODGERS, *Sec'y*,
165 Howard st., Dorchester, Mass.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing 10 A.M. July 17th and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, at the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st.

Prominent dentists have signified their intention of reading papers, and the clinics will all be of a new and novel nature. Clinic committee in charge of Charles H. Dilts,

Trenton, N. J.; exhibit committee in charge of Walter Woolsey, Elizabeth, N. J. Programs will be out June 15th.

Last year over eight hundred dentists registered in attendance. The Auditorium where the meeting is held is the largest and best adapted building on the Jersey coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

TENNESSEE STATE DENTAL ASSOCIATION.

THE annual meeting of the Tennessee State Dental Association will be held at Knoxville, Tenn., July 9 and 10, 1907. A splendid program is being arranged by the Executive Committee, and a most cordial welcome is extended to all.

R. J. MCGAVOCK, *Sec'y*,
Columbia, Tenn.

CHICAGO ODONTOGRAPHIC SOCIETY.

AT the annual meeting of the Chicago Odontographic Society the following officers were elected for the ensuing year: F. E. Roach, president; F. W. Gethro, vice-president; F. H. Zinn, secretary; G. W. Dittmar, treasurer; J. H. Woolley, librarian. Board of Directors—H. A. Drake. Board of Censors—F. B. Noyes, J. E. Hinkins, and C. E. Meerhoff.

FRANK H. ZINN, *Sec'y*,
100 State st., Chicago.

NEW YORK ODONTOLOGICAL SOCIETY.

THE annual meeting of the New York Odontological Society was held at the New York Academy of Medicine, 17 West Forty-third street, New York city, on December 18, 1906, with the president, Dr. F. T. Van Woert, in the chair.

The officers elected for 1907 were as follows: W. J. Turner, president; W. D. Tracy, vice-president; W. B. Dills, recording secretary; J. G. Fulton, corresponding secretary; F. C. Walker, treasurer; W. W. Walker, curator; W. B. Dunning, editor. Executive Committee—Ellison Hillyer (chairman), B. C. Nash, R. Ottolengui. Clinic Committee—R. M. Sanger (chairman), H. W. Gillett, J. W. Taylor.

WM. B. DUNNING, *Editor*.

NEW HAMPSHIRE DENTAL SOCIETY.

THE annual meeting of the New Hampshire Dental Society will be held at Plymouth, N. H., June 25, 26, and 27, 1907, beginning on the evening of the 25th. All members of the profession are cordially invited to be present.

FRED F. FISHER, *Sec'y*.

LOS ANGELES ASSOCIATION OF DENTAL ALUMNI.

AT a regular meeting of the Los Angeles Association of Dental Alumni the following officers were elected: Wm. Bebb, president; Genette F. Harbour, vice-president; W. W. Homan, secretary; Chas. E. Rice, treasurer. Program Committee—Jas. D. McCoy, J. F. Curran, and Horace E. Brown. Membership Committee—D. S. Gillespie, D. D. Cave, and H. Gale Atwater. Illegal Practitioners' Committee—J. F. Cook, Bert Boyd, and J. W. Neblett.

W. W. HOMAN, *Sec'y*.

ARMY DENTAL CORPS.

THE following changes in the stations and duties of dental surgeons are ordered: Dental Surg. Rex H. Rhoades from duty at Fort Sheridan to Columbus Barracks, Ohio, for duty, relieving Dental Surg. S. Davis Boak. Dental Surg. Boak will take the first available transport for Cuba. Dental Surg. John A. McAlister from duty at the Presidio of Monterey, Cal., to Fort Sheridan, Ill. (Dec. 28, W. D.)

Leave for seven days is granted Dental Surg. John A. McAlister. (Jan. 10, W. D.)

Dental Surgs. Ord M. Sorber and Edwin P. Tignor from duty in the Philippines Division, and will proceed on the transport to sail from Manila about April 15, 1907, to San Francisco, Cal., for further orders. (Feb. 5, W. D.)

Dental Surg. Edwin P. Tignor is relieved from duty in the Philippines Division, to take effect April 1, 1907, and is authorized to avail himself of the leave granted. (Feb. 9, W. D.)

Dental Surg. George E. Stallman, having reported at San Francisco, Cal., will proceed to Fort Sam Houston, Texas, for duty, relieving Dental Surg. Frank P. Stone, who will proceed to his home, Macon, Mo., for annulment of contract. (Feb. 15, W. D.)

ARIZONA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Arizona will meet at Phoenix, April 8, 9, and 10, 1907, for the purpose of holding examinations. The fee, twenty-five dollars (\$25.00), should be in the hands of the secretary twenty days before date of meeting. For further information, address

W. P. SIMS, *Sec'y*,
Box 58, Bisbee, Ariz.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold its next regular meeting at Minneapolis, in the Medical Building of the State University, on April 2, 3, and 4, 1907. All applications must be in the secretary's hands by 11 o'clock of April 2nd. Candidates will be furnished all necessary blanks and such other information as is necessary, upon application to

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE regular semi-annual meeting of the Maryland State Board of Dental Examiners for the examination of candidates for certificates will be held May 22 and 23, 1907, at the Baltimore College of Dental Surgery, Baltimore, at 9 A.M. Application blanks and full information will be furnished by

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

ALABAMA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Alabama will meet in Birmingham, Ala., on the Monday before the second Tuesday in May 1907. In addition to the regular written examination the following requirements will be added: Each applicant must fill at least two teeth—approximal cavities—one with gold, the other with alloy, work to be done under the immediate supervision of the board. Board to determine or pass on suitable selections of cavities. Board will try to furnish subjects, but failing to do so,

applicants for license must find or bring their own subjects, also instruments and material.

Each applicant must take or have taken an impression of his own mouth. Make a plaster cast of the same, cut from the cast the six anterior teeth, and make a bridge for same with porcelain facings. Cast can be made and facings fitted before the examination, but the backings must be put on and the facings arranged, also invested and soldered, under the supervision of the board, hard solder being required.

THOS. P. WHITBY, *Sec'y*.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, Ark., May 27 and 28, 1907.

A. T. McMILLIN, *Sec'y*,
Little Rock, Ark.

NEBRASKA BOARD OF DENTAL EXAMINERS.

THE next meeting of the Nebraska Board of Dental Examiners will be held at the State-house, in Lincoln, Nebr., May 29, 30, and 31, 1907. All applicants for examination must have their applications in the hands of the secretary five days before this date.

For further information address.

C. F. LADD, *Sec'y*.
1241 O. st., Lincoln, Nebr.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 13, 14, and 15, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

Applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before June 6, 1907. By order of Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

INDIANA BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Indiana State Board of Dental Examiners will be held in the Capitol at Indianapolis, June 11, 12, and 13, 1907. Applications must be in the hands of the secretary at least five days before the above date. Address

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examination of applicants for registration will be held in Manchester, N. H., June 11 to 13, 1907.

A. J. SAWYER, *Sec'y*.

WEST VIRGINIA BOARD OF DENTAL EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold their next meeting for the examination of candidates at Wheeling, W. Va., June 12, 13, and 14, 1907. For further information address

H. M. VAN VOORHIS, *Sec'y*,
Morgantown, W. Va.

TEXAS BOARD OF DENTAL EXAMINERS.

THE Texas State Board of Dental Examiners will hold their next regular meeting at San Antonio, Texas, June 10, 1907, at 10 A.M. For further information address

C. C. WEAVER, *Sec'y*,
Hillsboro, Texas.

CALIFORNIA BOARD OF DENTAL EXAMINERS.

THE next examination of the California Board of Dental Examiners will be held in Los Angeles beginning June 10, and in San Francisco beginning June 17, 1907.

C. A. HERRICK, *Sec'y*,
Jackson, Cal.

IOWA BOARD OF DENTAL EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, June 6, 7, 8, 10, and 11, 1907. Applicant must hold a diploma from a college on the accredited list of the National Association of Dental Examiners, and must state where he attended first, second, and third year of college. Address

E. D. BROWER, *Sec'y*,
Le Mars, Iowa.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1907.

February 5.

No. 843,208, to CHARLES W. HIEBER. Chair.
No. 843,273, to WILLY HOMANN. Dental bur and excavator.

February 12.

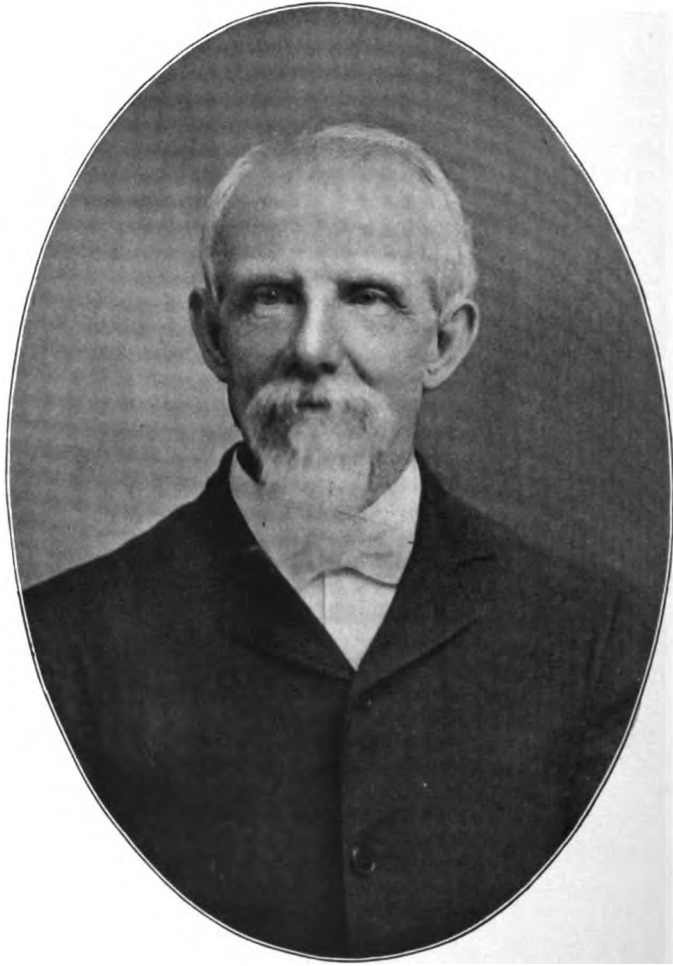
No. 844,079, to ELLSWORTH ARMSTRONG. Dental matrix.
No. 844,181, to CHARLES M. OVERBAUGH. Dental floss holder.

February 19.

No. 844,395, to EDUARD PENKALA. Toothbrush.
No. 844,781, to HENRY P. DAVIS. Dental gold pellet holder.

February 26.

No. 845,064, to FREDERICK P. DROWNE. Toothbrush.



DR. J. HALL MOORE.

THE DENTAL COSMOS.

Vol. XLIX.

MAY 1907.

No. 5.

ORIGINAL COMMUNICATIONS.

THE PRESENT STATUS OF THE PORCELAIN INLAY.

By J. Q. BYRAM, D.D.S., Indianapolis, Ind.

(Read before Section I of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

THERE are periods in the history of the dental profession when its thought seems to be turned largely to one subject. We have just passed through the porcelain era, and many of the leading journals have been devoting a large amount of space to porcelain. We now have another outburst of enthusiasm on inlays, but this time the enthusiasm is for the gold instead of the porcelain inlay. After the gold inlay has run its course we shall be so familiar with the inlay principle of filling teeth that no progressive dentist should plead ignorance of the subject.

While a great deal has been written on porcelain, many of the writers, through a fit of enthusiasm, have made statements which have caused disappointment to those attempting to follow their teachings. It is probable that those

gentlemen who advocated porcelain as a filling material for all cavities, and who suggested that the gold and amalgam pluggers be discarded, to be used no more but to be kept only as relics of barbarism, are finding some use for these instruments today—for we have learned that porcelain should take its place with other filling materials, and not entirely displace them.

NEED OF THOROUGH KNOWLEDGE OF PRINCIPLES AND MASTERY OF TECHNIQUE.

Although many of the journals have been filled with articles on porcelain, it is surprising that such a large number of dentists have no knowledge of the inlay principle of filling teeth. And many are discouraging the use of porcelain because they are not familiar with its good quali-

ties. They may have seen a few failures, and because of these failures and their own ignorance, they are condemning it. Such dentists remind one of the laity who condemn modern surgery because they always learn of failures, but never of the many successful operations. There are others who, through inexperience and lack of knowledge of the principles of porcelain work, have made failures—they also are condemning it; for too many dentists have bought porcelain outfits and attempted the construction of porcelain inlays with but little conception of that which they were attempting.

The construction of porcelain inlays requires precision in each step of the operation. The best work can be accomplished only with a thorough knowledge of the principles of inlay work and the properties of porcelain, with mastery of technique, on the part of the operator.

Porcelain inlays have passed the experimental stage, and their use as an esthetic filling must be more universally recognized. The dentist who fails to master the technique of constructing porcelain inlays will be compelled to refer many of his patients to a specialist in this branch of dental art, for porcelain is the material that should be used to fill most cavities in incisors and canines.

As the size of cavities in vital incisors and canines increases, just in that ratio does the indication for porcelain inlays increase; for if a gold filling is conspicuous at the gingival margin of an incisor or canine, an approximo-incisal filling is conspicuous to a much greater degree. While there is a limit to the size of an inlay that may be successfully inserted in an approximo-incisal cavity, there are nevertheless too many crowns adjusted on anterior teeth. The ease with which a crown may be adjusted frequently causes operators to overlook the good qualities of porcelain inlays in many large cavities.

Porcelain makes a desirable filling for those approximo-occlusal cavities where the cavity extends too far beneath the gingival margin and involves a large portion of the occlusal surface. In those cases where it is impracticable to burnish

a matrix in the cavity, an impression may be swaged of gold 3-1000 of an inch or platinum 1-500 of an inch. If a heavy material is used for the matrix, there will be less danger of warpage during the process of fusing. The matrix, however, should become a part of the inlay. It should be trimmed close to the margin of the cavity after the final fusing, and after the inlay has been set, the matrix should be finished to the margins of the cavity at a subsequent sitting. This insures a better-fitting inlay, and one the margins of which are less liable to fracture. There is also less liability of the cement being washed away to any marked degree, for the matrix protects the cement in such a manner that a new wash-line does not form at those points where the porcelain may fracture at the margins.

While porcelain has the advantage over gold of giving a filling that more nearly harmonizes with the natural teeth, and one that is a non-conductor of thermal and electrical changes, it has still another advantage which should appeal to all conscientious operators, in that imperfect fillings are easily dislodged. A large number of faulty gold fillings which do not preserve the teeth are retained by deep grooves, so that it is almost impossible to dislodge them, thereby deceiving the patient, and many times the dentist. If the porcelain filling is faulty it is dislodged, and the patient knows immediately that the services of a dentist are required.

CAVITY PREPARATION.

It is essential that beginners should understand cavity preparation for inlay work. It is not uncommon for dentists to construct inlays for patients before they have studied the principles of cavity formation. It is not difficult to change the method of cavity formation, even though one has been preparing cavities for gold and amalgam for a long time, if the principles of retention for the different fillings are thoroughly understood.

The preparation of many cavities requires the sacrifice of sound tooth-struc-

ture in order to secure the necessary retentive resistance, to prevent frail margins of porcelain, and to obtain proper color. The writer has found in many instances that more sound tooth-structure is involved in the preparation of the cavity for porcelain inlay than would be involved in preparing the cavity for gold. Most porcelain workers are agreed that the cavities should be so prepared that the inlay receives as much retentive resistance as it is possible to give it. Absolute angles, both on the margins and in the cavity, are to be avoided. The cavities should be so prepared that all frail enamel is removed. It should be borne in mind that porcelain is a friable material; this fact is often overlooked, for too often we are careless in our cavity preparation; weak margins of porcelain are formed, which cause the filling to be imperfect, and all the blame is attributed to the material used and not to the method applied.

MATRICES—MATERIAL AND MANIPULATION.

The selection of material for matrices is partially dependent upon the kind of porcelain to be used and the personal equation of the operator. The writer uses gold for the construction of some matrices for low-fusing porcelain, but he believes platinum to be preferable in most cases. The elasticity of the platinum tends to prevent the distortion of the matrices in the withdrawal from many cavities, and because of the pliability of gold, the matrix will not always retain its original shape in the withdrawal.

The technique of burnishing a matrix is dependent upon the material. If thin gold is used, it should be worked to place with cotton or spunk, and very little burnishing with steel instruments should be done. If platinous gold or platinum is used, most of the burnishing may be done with steel instruments. A piece of foil, large enough to cover the cavity and to be held in position with the thumb and first finger, should be placed over the cavity. Use a ball burnisher as large as the cavity will permit, and work the ma-

trix into the seat of the cavity. After the matrix has been roughly burnished with the large ball burnisher, select a smaller one, and continue the work. Then place a small amount of hard wax or camphor in the matrix and swage it into the cavity. With a piece of tape or rubber dam, turn the matrix over the margin of the cavity. Remove the matrix and trim off the surplus foil, leaving enough material to cover the tooth and to give its contour. Anneal the platinum in the furnace, re-insert the matrix, and re-swage it by filling with camphor or hard wax; then swage it again with tape. If care be taken to conform the metal to the tooth before the final swaging is attempted, an accurately fitting matrix will be formed.

CARRYING THE MENTAL IMPRESSION OF TOOTH-FORM.

Cavity preparation may be thoroughly understood, the technique of matrix formation may be perfected, but until one can carry tooth-form in the mind's eye, one cannot construct inlays in the most artistic manner. Many operators can insert gold and amalgam fillings in such a manner that the lost tooth-structure is replaced with proper contour, but when they attempt to fill a matrix with porcelain the eye and hand do not work in unison, which results in an ill-contoured filling. One requisite of a skilful porcelain worker is the faculty of looking at a matrix and carrying the form of the lost portion of the tooth in the eye. To those who are unable to create a proper mental impression of the tooth-form, I would suggest a thorough course in tooth-carving as being of great assistance. Form cubes or rods of porcelain by mixing the porcelain to a creamy paste with water, and pouring into a matrix made of blotting paper. Then, with proper carving instruments, carve a tooth from the block of porcelain. Another requisite of a skilful porcelain worker is dexterity in handling the matrix and the instruments. Many operators handle matrices as though it were impossible to change their shape. Until one has become skilful in manipulating the matrix after it has been

properly formed, one may expect ill-fitting inlays. The matrix should be so protected and the fingers so guarded that all carving may be done in the matrix without distorting it.

Every porcelain worker is asked, what porcelain do you use? To such questions the writer usually replies by stating that he uses any of them. It makes little difference which porcelain one uses—but one should learn to use porcelain. The difficulty with many beginners is their unwillingness to devote the time to the experimental work which is required to obtain a thorough knowledge of the properties of porcelain. The general principles of manipulating all porcelains are the same. They may be mixed with alcohol, but this destroys their power to be molded and carved. Likewise all porcelains may be mixed with water, and this method insures the possibility of molding and carving.

COMPOSITION OF PORCELAIN.

In order to understand better the properties of porcelain it is necessary to consider the ingredients of which it is composed. Such a consideration shows porcelain to be made up of three classes of substances: (1) Three basal ingredients—silica the oxid of silicon, kaolin the silicate of aluminum, and feldspar the double silicate of aluminum and potassium—which are very refractory substances; (2) fusible substances known as fluxes, which fuse at a lower temperature, and which by combining with the basal ingredients increase the fusibility of these refractory substances, and (3) metals or their oxids, which are used as pigments, and which by combining with the porcelain under intense heat produce the various colors.

Silica and kaolin when heated separately withstand intense heat without undergoing any perceptible change. Feldspar undergoes liquefaction when subjected to a high degree of heat. When feldspar is added to silica and kaolin, the mass undergoes a chemical change which under intense heat causes it to vitrify. The materials commonly used as fluxes

to increase the fusibility of porcelain are sodium and potassium carbonate, or some material containing some other salts of sodium or potassium. When any of these materials are added to the basal ingredients, the fusibility of the mass is increased in ratio to the amount of flux added.

It was my good fortune to carry on a line of experiments on the fusing of different porcelains. After making over three thousand experiments, the following deductions were made:

(1) Porcelain has no definite fusing-point.

(2) By prolonging the time of exposure to heat, a thoroughly fused porcelain may be obtained at a comparatively low temperature.

(3) That porcelain fused at a low temperature for a long time will maintain its characteristic color.

(4) That low-fusing porcelains may be made of high-fusing porcelains by repeated fusing and grindings, but the properties are changed.

(5) If a piece of porcelain be thoroughly fused, then heated repeatedly to the maximum fusing-point, it becomes over-fused.

(6) That porcelains containing a large percentage of flux are more easily affected by bubbles than those that are more nearly composed of the basal ingredients, and that they should be heated more slowly.

Although all porcelains have properties in common, there are, however, certain properties that characterize each manufacturer's product. It is important that these characteristic properties be thoroughly understood in order to obtain the best results.

COLOR.

The power to obtain proper colors in the construction of inlays is a gift that cannot be easily imparted to others. This faculty can be acquired by a thorough knowledge of the principles of color formation and an eye trained to detect the delicate shading of colors in both the natural teeth and in porcelain.

One of the prevalent theories of color formation from pigments, known to artists and colorists, treats red, yellow, and blue as primary colors. According to this theory the many colors used by artists and colorists are produced from these three. When two of the primary colors are combined secondary colors are produced. Red and yellow, for instance, give orange; red and blue give violet, and blue and yellow give green. The excessive predominance of one color over another yields the hue to that color.

By combining the three primary colors so that complete absorption of light takes place, black is formed. The colors produced by the combination of the three primaries are termed tertiary colors. The third primary color, however, does not produce a new hue, but merely saddens the other two by forming a certain amount of gray or black in the combination. They are often called the dulled or broken tones of the primaries and secondaries.

Colors have three qualities, known as hue, purity, and luminosity. The excessive predominance of one color over another yields the hue to that color, and the greater the predominance the stronger will be the hue, *e.g.* when blue and yellow are mixed green is produced; if yellow predominates, the green will have a yellowish hue. The purity of a color is its lack of mixture of white or black or of any color. These admixtures not only weaken the color, but also change its character. This can be shown by adding a white porcelain to a yellow—the yellow is not only diluted, but tends to take a hue. The luminosity of a color is measured by the amount of light reflected to the eye, and is therefore independent of hue or purity. The most luminous color is yellow, while the least luminous is violet; and between these extremes are all the intermediate degrees of brightness. Those teeth wherein yellow and blue predominate appear more translucent because they reflect or transmit the rays; while those in which gray and brown predominate have a somewhat dull appearance, because their power of reflection and transmission of light is not so great,

for more of the rays are absorbed on the surface.

In order to become familiar with some of the phenomena of color formation, and to train the eye to detect the hues of colors, the writer finds it both pleasant and profitable to experiment with water- and oil-colors and porcelain. An outfit of water- or oil-colors containing the three primary colors is used. The secondary and tertiary colors with their various hues are produced.

Every porcelain worker should have the colors in porcelain that approximate the three primary colors, and study the formation of colors as applied to porcelain art. While it is impossible to procure pure red, yellow, and blue porcelains, it is possible, however, to obtain colors which when mixed in varying proportions will show the color formation in porcelain. I have found a special red and blue porcelain manufactured by The S. S. White Dental Mfg. Co., and a yellow by Mr. Robert Brewster, to meet the requirements for this work best of any of the porcelains in my possession.

CEMENT IN RELATION TO COLOR.

That the cement is a factor in the inlay problem is shown by the variation of color so often noticeable when the inlay is set. The inlay may be a good match when the incidence of light is at such an angle as will permit its transmission. But when the angle of incidence is changed, the color of the inlay may change. This phenomenon is caused by the cement—which is an opaque body—excluding the light from the dentin, absorbing certain rays, and reflecting others. And it is the reflected rays that change the color of the inlays.

For small inlays constructed of a monochromatic porcelain, a cement which is of the same color as the porcelain but of a lighter hue is best; for the rays that are transmitted through the porcelain are not absorbed by the cement, but reflected to the surface, with practically no change of color other than that due to intensification. I believe a pure white cement would be the best for set-

ting large approximal and all approximo-incisal inlays constructed of multi-colored porcelain, because white bodies do not absorb light, but reflect it. The same rays that are transmitted to the cement would then be reflected to the surface.

THE FUSING.

The color of the inlay is many times affected by over-fusing the porcelain. It is a fact that over-fused porcelain becomes lighter, and tends to take a glass-like appearance. If porcelain remains in contact with the maximum heat long enough, or if it is brought to the maximum-fusing heat by repeated fusing, it tends to form a glass-like mass. All the hues of a color, from the normal to a light one, may be made from the same porcelain by increasing the heat above its maximum fusing-point—but this is done at the sacrifice of its strength. In applying the enamels over the foundation, each layer should be fused only to a

high biscuit, heating the enamels to the point of glazing only at the final fusing. This prevents over-fusing the first layers.

I wish to condemn the method of fusing porcelain at its maximum temperature for a short time. It makes the porcelain more brittle, and causes the formation of minute bubbles throughout the mass. I also wish to protest against placing the porcelain in an intensely hot furnace, for it causes a crust to be formed on the surface, which prevents the escape of gas. This gas will seek the point of least resistance, which will be along the margin, and result in the formation of bubbles along the margin of the inlay.

If porcelain art is to maintain the high place in the dental art that its advocates are claiming for it, it must be treated as an art. And those who practice this art should acquire a thorough knowledge of the subject, in order that this knowledge may be placed in proper action.

REFLECTED SHADOWS ACCOMPANYING PORCELAIN FILLINGS.

By C. N. THOMPSON, D.D.S., Chicago, Ill.

(Read before Section I of the National Dental Association, Atlanta, Ga., September 18, 1906.)

IN restoring the lost parts of teeth with porcelain inlays, an exact match in appearance is probably considered the most difficult part of the operation, the success of which depends upon the exactness with which we produce the natural conditions. But depending as we do upon materials that differ in physical properties to the extent that porcelain and cement do from the natural tooth, we are compelled to make use of certain artifices intended to offset the shade that falls as a result of the unnatural reflection, refraction, absorption, and transmission of light by these materials.

Color, of course, is a factor of great importance, and in itself would constitute an ample topic for an entire paper; but when we remember that it is quite impossible to invisibly repair a broken porcelain tooth by means of cement—in fact, almost impossible to even replace the fragment in any way so that the fracture will be invisible—it would seem that color is not the only factor in the final appearance of finished porcelain fillings. The fragments being absolutely exact in color, translucence, form, and thickness, and the cement being of a good color, it is evident that aside from color there are

other phases of the phenomena of light which affect the finished inlay detrimentally, unless forestalled. The only way in which the fragment of a broken tooth can be replaced—concealing the fracture—is to moisten both with some liquid of the same reflective index as the tooth, which in absolutely filling the space, cancels the reflective surfaces of the fracture, both internally and externally, thus permitting the light to proceed as it did before the break occurred.

THE CEMENT PROBLEM IN RELATION TO COLOR.

Water answers admirably, but unfortunately it, like all other translucent substances of which we know, is of no practical value as a cement, so we are obliged to return to zinc oxyphosphate and its gloom, because it is *adhesive*. It may not be out of place to mention that although Ascher's enamel cement has practically no adhesive properties, and is consequently of no value in retaining inlays, its power of transmitting and reflecting light is so nearly equal to that of the natural tooth-enamel that certain shades of it interfere very little with the free passage of light, and it therefore comes very near being ideal in appearance. It is unfortunate that the good qualities of the cements mentioned cannot be incorporated into one—for a cement of the proper color, translucence, adhesiveness, and strength to fill all requirements, would mark the beginning of the end of the inlay question.

DIFFERENCE BETWEEN THE NATURAL TOOTH AND PORCELAIN IN REACTION TO LIGHT.

A study of the normal tooth reveals the fact that its exact reproduction is impossible, yet to restore tooth-structure in appearance with porcelain without due consideration for the details of the make-up of the normal tooth is a mistake, for an examination of a cross section of the natural tooth reveals the enamel nearly transparent and the dentin nearly opaque. Compare this with a cross section of a

porcelain tooth, and it is not hard to discover the reasons for some of our difficulties, as well as to know that there must be method in our efforts if we would secure results.

Dentin is so nearly opaque that it transmits light but feebly. Its opacity seems to be due, as much as to anything else, to the condition of its external surface, which is without glaze—under the magnifier it seems rough, like fine sand-paper. The external surface stops the light as do crushed transparent substances generally—as for instance common salt—for the reason that the rays of light are so often reflected among the particles on the surface that they are scattered into a multitude of crossed reflections that appear white, and therefore cannot enter. Thus it follows that whatever surface will not admit light will also refuse to allow a reflected shade to pass; consequently if the dentin can be restored with a very high-fusing porcelain that becomes densest before it glazes, that presents a vitreous surface resembling sand-paper, and of the color of dentin, we have produced a foundation for the filling that will not absorb sufficient light to cause a shadow, and which, if not glazed by a subsequent baking, will still retain the power to arrest transmitted light, no matter how the colors and enamel are laid on afterward.

The only phase of color I shall mention is that of red. A pulpless tooth usually assumes a grayish aspect, probably due to the oxidation of the contents of the tubuli of the dentin, whereas there is something in a healthy tooth that gives it a lifelike appearance. We all know that the dentin immediately covering the pulp is pink, and if it be a fact from any cause that there is a red or pink tinge to the dentin close to and surrounding the pulp of a vital tooth, may it not be that the color of the normal dentin, if analyzed, would reveal red? Following this thought, it has been the custom of the writer to make use of red in deep cavities, laying a little of it on the matrix beneath the foundation body in the vicinity of the pulp, and the result produced warrants the supposition that red

is present in vital teeth, and is necessary for the production of a lifelike filling.

Let us study the normal tooth filled with porcelain as it is seen in the mouth under normal conditions.

First, it is covered with moisture, which partly veils small mechanical defects, modifies the superficial, structural, and physical differences of the filling and tooth, fills the interspaces of the cement at the surface, and reflects a portion of the white light.

Next, through it we see the convex surfaces of the tooth and filling where another portion of the white light is reflected, and where reflections from nearby objects begin to appear. The tooth-enamel is as though polished, differing from the glaze of the porcelain. However all teeth are not alike in this respect, even those in the same mouth may differ. But seldom do we see natural tooth-enamel having as high a finish as well-glazed porcelain, and consequently it improves most porcelain fillings to polish that portion next to the labial cavity margin after it is set because it makes the surfaces more nearly alike. Comparing porcelain enamel with the natural structure, we find that it is not difficult to produce a substitute that resembles it in a general way—until its reflective and refractive powers are considered. Its translucence is very much the same as that of natural enamel, but as it is only a fused translucent crystal covering the inner parts of the filling, it becomes an elliptical cavo-convex lens, with all the abortive phenomena which accompany such instruments. The natural enamel with its radiative arrangement of enamel rods, whose refractive and reflective indices vary in accordance with their various positions, produces an entirely different instrument, for at the median line of the teeth the enamel rods point nearly toward the eye—those on the same perpendicular plane, while those on the sides are at right angles to the long axis of the tooth, which must produce a reversal of the reflecting index of each rod and consequently of the portion of the tooth which they occupy. This in the writer's opinion explains why an approximal gold

filling appears not to darken its approximating neighbor, if it be a sound one, to the extent that it would if filled with porcelain, because natural enamel does not accept impressions as does the porcelain enamel, on account of the repeated reflections among the rods; also explains why the appearance of most approximal fillings are improved by a very thin layer of opaque white at and on a line with the contact point, or a trifle more to the labial on the approximal exterior, which prevents the passage of the reflected shade.

OTHER OPTICAL PRINCIPLES INVOLVED.

As a consequence of the rectilinear motion of light, opaque bodies cast shadows, which fall as a result of some obstruction to the free passage of light, and their location, extent, and intensity are dependent upon the extent to which the light-rays are transmitted, reflected, refracted, or absorbed by the obstacle.

A shadow is partial darkness caused by the intervention of something between the space contemplated and the source of light. Reflected shade is that phase of the phenomena of light that affects porcelain inlays following final insertion.

All illuminated bodies scatter or reflect light, and are distinguished from each other by the kind and amount of light they send to us, their power of selective absorption and surface reflection determining the color. If the source of light be a point, as in the electric arc light, the shadow is sharply defined; if, on the other hand, it comes from a luminous surface, as the sun, the edges of the shadow are fringed and imperfect, due to the angular magnitude of the sun. For example the shadows of minute objects disappear almost immediately in sunlight, whereas the same objects in the arc electric light cast a well-defined shadow for a considerable distance if thrown upon a screen. This explains why porcelain fillings are more conspicuous in artificial light than in sunlight, the shadows thrown appearing more definite.

When light passes from one optical me-

dium to another, a portion of it is always turned back, *i.e.* reflected. This partly explains why a highly glazed filling that does not appear correct may be improved by grinding or polishing. A slight roughening of its surface causes less direct exterior reflection, and although it thus renders the surface slightly more opaque, it renders the deeper coloring more prominent, because light is reflected regularly and more fully by a glazed surface.

One of the fundamental laws of optics is that the angle of incidence in light-rays is equal to the angle of reflection, which helps us to understand why the shadow that is thrown upon one object by another may be passed on and accepted as the real shade of the object thus thrown in the shadow, particularly when the shaded object is convex, as are the teeth—which greatly increases their range of power over the plane surface for accepting and reflecting impressions that occur at right angles to the perpendicular, as are the approximal surfaces of teeth, where shade is most apt to occur, and usually does, particularly if that surface be discolored, decayed, or filled. In any event, whatever shade exists in a given approximal space is reflected back and forth from one surface to the other until it reaches a point on the convexity of the tooth that will reflect it to the eye, which establishes the limits of the shade at that point.

For example, a gold and a porcelain filling in contact between the central incisors: The porcelain filling, even though an exact match in color, will appear darkened as soon as placed in a cavity fronting a gold filling, because instead of returning the reflected shade to the gold again, its convexity sends the shadow of the gold to the eye, which gives it a saddened appearance. But if the filling be not scientifically constructed it will absorb a portion of the shadow and return it to the eye by internal reflection, which will make it appear still more darkened. To offset the discrepancy between artificial and natural enamel in transmitting impressions, it becomes necessary, in protecting approximal porcelain fillings against side

shadows to cover the approximal exterior of the filling fronting the shade with a thin layer of opaque white, which practically prevents shadows from entering the filling, thus allowing it to appear as intended, because it cannot reflect a shade that it does not receive.

Reflection always accompanies refraction, which phenomenon causes much of the uncertainty of results in laying on colors, because the enamel being translucent, light passes through it to the pigments, where color is established, and being returned to the eye by internal reflection, in emerging through the enamel it is refracted and reflected at both surfaces of the enamel, and scattered by its convexity. This, in a meager way, in connection with the fact that we cannot see our colors until after the filling is fused and finished, is the reason why the color problem is so mystifying.

A solid body immersed in a liquid having the same reflective index as the solid, vanishes, and light in passing through media of different refractive indices is always reflected, and this reflection may be so often repeated as to render two transparent substances practically impervious to light. An opaque white is produced in this way. The blackest clouds owe their gloom to this repeated reflection, which diminishes the transmitted light when seen from beneath; hence, also, their whiteness by reflected light. Common salt is white from the same cause, and transparent bodies generally, when crushed to a powder—because, though the particles transmit light freely, the reflections at their surface are so numerous that the light is scattered as is sound in echoes. A piece of glass is nearly transparent; crush it, and it becomes an opaque white; wet it, and it becomes semi-translucent. If it and the water were of the same reflective indices, the glass would disappear and the water would appear clear again. This partly explains why a filling of porcelain becomes a trifle more translucent, though a trifle darker after it is set, and becomes filled with moisture from the saliva; it also reveals one phase of the shadow that falls from the cement, in that the dark-

ness of the cement is emphasized by the gloom produced by its repeated reflections in the body of the filling which retains it. It also suggests that the nearer a porcelain enamel can be based upon this plan—that is, two crushed crystalline substances of unequal refractive indices and of unequal fusing-points, the one to be suspended as it were, in the other, as is the crushed glass in water—the closer we will be to the production of an enamel that will come as close to nature as we could ever get, because while it would appear quite translucent, yet it would not transmit light as freely as some of our present enamels, and therefore would be more natural.

INTERNAL SHADOWS.

The only rational plan for controlling internal shadows, which in the main are caused by cement, is to have the latter covered by the natural tooth, so outlining the cavity if possible that the eye will find tooth-substance interposed between it and the submerged cement—between the tooth and filling. Strictly labial cavities are of course not included in this statement, yet they are partially protected in another way, for most labial cavities occur upon the gingival third of the tooth-crown, and the enamel necessary to reproduce nature is very thin at that point. This permits a correspondingly greater amount of foundation body, that if properly made will not transmit much reflection from the cement below it, and the amount that it does show will depend upon how thick the enamel is, for it will transmit such reflection readily, allowing the cement to show through at the margins. Fillings made in this way are affected less by lip shadows than if the enamel be thick or the filling semi-translucent.

In approximal cavities it is usually possible to cut beneath the labial plate, at least slightly, so that the submerged cement is hidden, as it were, below it, to the extent that light, in order to reach it through the filling, must strike the surface of the filling at such an angle that it would be reflected away, so that the tooth

would be lighted by direct rays and appear as intended.

Definite shadows from cement imply that light, after being permitted to pass through the porcelain, must fall upon it, some of the light being absorbed, the diluted remainder being reflected back into the filling and returned to the eye direct, producing a saddening effect. Besides, reflection from the cement is increasingly darkened in proportion to the amount of porcelain the white light traverses in getting to it, and this applies likewise to the shadow.

When a filling is correct before cementation, and looks dead or leaden afterward, it is probable that its changed appearance is the result of light passing through several layers of semi-translucent color-pigment, each one selecting its portion of the white light, thus filling the light that reaches the cement with gloom, which when reflected back through the filling, throws the whole into discord, producing a drab or gray—a color obtained by mixing the primary pigment colors. Such results are possible only when the filling transmits light too freely; because had the light been reflected back by the foundation body after penetrating the colors, as it should if correctly made, there would have been no light to reach the cement, consequently none to be reflected. Therefore the only detrimental effect that could be produced by the cement would be in rendering the filling more opaque and a trifle darker.

Fillings that appear correct from one direction and not from another are not sufficiently protected. This difference in appearance is due to reflected shade, which the faulty construction of the filling permits.

There is probably no way to entirely prevent shadows from being reflected into porcelain fillings, yet it is possible to confine both their extent and intensity to narrow limits, as follows:

First: By cavity formation, in order to conceal the submerged cement.

Second: By using a thin layer of opaque white on the approximal exterior of the filling that will prevent the entrance of reflected side shade.

Third: By making use of a foundation body of the same color and opacity as dentin, having an exterior surface which, being scintillant or faceted like the diamond, will act as a barrier to the

passage of the light in the same way as does salt or crushed glass, which seems the only way of reproducing natural conditions as regards the phenomena of light.

RISE AND DEVELOPMENT OF INTERMAXILLARY FORCE.

By CALVIN S. CASE, D.D.S., M.D., Chicago, Ill.

IN the last May number of the *Dental Review*, under the title "The Intermaxillary Anchorage in Orthodontia," by Dr. Martin Dewey, may be seen one of the many conspicuous attempts to establish the belief that the origin of the disto-mesial intermaxillary force and its modern employment arose with the "new school" of orthodontia.

These frantic efforts, which do not hesitate to deliberately ignore and falsify published data, appear to be due to the childish fear that the new school will lose prestige and strength if any of its members acknowledge, even in the slightest degree, that it is indebted to the so-called "old school" of orthodontia for this foundation principle of its teaching.

Whereas it happens to be a fact—as will be proved in this article—that about ten years before the organization of the "new school" the disto-mesial principle of elastic intermaxillary force arose from a legitimate birth and attended by presentation of the principle at many of the most prominent dental societies of the world, from which it was widely published in proceedings and in the leading dental journals. Moreover, at about this time it had begun to be employed by prominent orthodontists, in exactly the same manner and for the same disto-mesial shifting of occlusal relations of the buccal teeth that has been recently unfurled as the banner discovery of a "new school."

It is with considerable reluctance that I take up my pen for the second time to tell, at this time, all the truth about the origin and development of the intermaxillary force. For I fully realize that the question as to who was the first man to employ this or that method or principle of practice is of very little interest to the profession in general. Nor would I say more than I have said upon this subject, were it not that in addition to the continued reiteration of the most foolish and absurd claims, which were sufficiently disproved in my article published in the May 1904 issue of this journal, it has come to a point where my honesty is impugned and I am practically accused of attempting to steal an honor which belongs to others.

A FANTASTIC "NEW SCHOOL" CLAIM.

Dr. Dewey, it seems, has been chosen to spring the final coup, with the surprisingly fantastic claim the implied gist of which is that Dr. Angle, after all, is the real inventor of the principle of the so-called "Baker anchorage," having published it in 1891, and which, he says, "has been used more or less by Dr. Angle from that time to the present." That some time after the publication of this principle by Dr. Angle, Dr. Baker employed a "modification of it." It is also magnanimously admitted that Dr. Case also employed "this principle as first given us by Dr. Angle"—"probably at

about the same time as Dr. Baker"—but, as he used it only "as an *auxiliary* to an occipital anchorage," and thus "did not grasp the full possibilities of the *principle*," it is implied that he should receive little or no credit, compared with Dr. Baker, who "used the intermaxillary anchorage alone and independent of other anchorage."

The following is a verbatim block taken from Dr. Dewey's article, which will serve as a fair sample of his claims. The italics are my own:

The origin and principle of intermaxillary anchorage was given to us in 1891 and has been used more or less by Dr. Angle from that time to the present.

In 1893 Dr. C. S. Case of Chicago used the intermaxillary anchorage as an *auxiliary* to the occipital anchorage in treating a case of Class III. This case was reported at the Columbian Dental Congress. Dr. Case operated more or less on all the teeth by the use of intermaxillary anchorage, but did not grasp the full possibilities of the principle because he used it as an auxiliary to the occipital anchorage. The principle was the same as advocated by Dr. Angle in 1901.

The first record I can find of the more extensive use of the principle as first given us by Dr. Angle, independent of any other anchorage, was as used by Dr. H. A. Baker of Boston. Dr. Baker accomplished something which had never been done before by the use of intermaxillary anchorage wholly independent of any other form of anchorage. He moved the entire number of lower teeth forward. Heretofore such movement was only accomplished by the method of Dr. Kingsley known as "jumping the bite." When the case was shown to Dr. Angle he became so impressed with the possibilities of the extended use of his principle that he named this form of intermaxillary anchorage the "Baker anchorage" in remembrance of Dr. Baker.

The use to which Dr. Case put intermaxillary anchorage in 1893 was similar to the use by Dr. Baker, except that Dr. Baker used it in Class II, while Dr. Case used it in a Class III case. We also find that Dr. Case used intermaxillary anchorage as an auxiliary to occipital anchorage, while Dr. Baker used intermaxillary anchorage alone and independent from any other anchorage. The use to which Dr. Baker carried the principle of intermaxillary anchorage was farther than Dr. Case went.

This certainly is amusing, to say the least, in the face of the true history of

the intermaxillary force. Dr. Dewey will not even allow that the case which was fully described in a paper, and illustrated with charts and models and the practical apparatus, at the Chicago Dental Society February 2, 1893, and at the International Dental Congress, August 17, 1893, was principally regulated in 1892; nor does he seem to be conscious that I prominently referred to this principle of applying force in papers read before the Illinois State Dental Society in 1894 and 1895; at the Tri-State dental meeting (Ohio, Indiana, and Michigan) in 1895, etc. (In one of these early papers, among other things, I said: "The extending of rubber bands from the extreme buccal endings of appliances attached to the upper or the lower teeth, to points upon the occluding set opposite the first bicuspid, *has become a common one in my practice* in nearly all cases where there is an abnormal antero-posterior relation of the upper and lower front teeth.") And with it all, to finally belittle my use of this force, which he intimates was *only in one case*, he reiterates Dr. Angle's recent claim* that because this force was employed by me as an "auxiliary" to other forces in that case, it lessened its value as a principle of force, and shifted the honor of its discovery to Dr. Baker, whom they well know employed it for the first time several years later. This is especially nonsensical in view of the fact that there is no force in orthodontia that is not used at one time or another as an *auxiliary* to other forces.

*Angle, "American Text-book of Operative Dentistry," 3d edition, 1905, page 753: "To the best of my knowledge and belief we are indebted to Dr. H. A. Baker of Boston for this idea, he having used it in the retraction of the protruded incisors of his son a number of years ago, and it was from him I received the idea. I have hence called it the "Baker anchorage." Dr. Calvin S. Case of Chicago also employed this form of anchorage, probably at about the same time as Dr. Baker; not, however, as an anchorage complete in itself, as did Dr. Baker, but only as an auxiliary to occipital anchorage in a case belonging to the third class. It is reported in the Transactions of the Columbian Dental Congress."

Moreover, Dr. Baker's object in employing the disto-mesial action of the intermaxillary elastics (as will be shown by his own words) was as an auxiliary to aid in forcing the entire mandible forward for "jumping the bite," and not in an interstitial movement "of the entire number of the lower teeth forward," as Dr. Dewey would have us believe; nor for "the retraction of the protruded incisors," as Dr. Angle now sees fit to characterize it; though both of these movements doubtless occurred to a slight extent during the short time it was employed by him practically in that case, in which he claims to have produced the desired movement "in two months' time."

CLAIM REFUTED BY THE TESTIMONY OF THE BENEFICIARY HIMSELF.

I am pleased to say that there is no direct evidence to show that Dr. Angle had anything to do with this and similar efforts from the pen of his college assistant, Dr. Dewey, especially as he has always disclaimed—even in his last writings—any knowledge of what we understand as "intermaxillary force" or anchorage, *until the idea was given to him by Dr. Baker*. Even if he were inclined, his better judgment would hardly permit him to attempt working off his simple expedient published in 1891 (which was for the liberation of impacted labial teeth with rubber ligatures to the lower teeth, or direct intermaxillary force) as the origin and "principle" of the disto-mesial intermaxillary force; especially as by his own acknowledgment he never attempted to employ it in this way until about ten years afterward—notwithstanding Dr. Dewey's inference to the contrary. And during this time he did not even associate his device with the disto-mesial action of intermaxillary elastics which he must have been aware was being employed by others, and which he afterward published as "a novel method of exerting force," *thus acknowledging it as a distinct principle by naming it the "Baker anchorage."*

One might with equal propriety claim that the operations of extruding

the teeth—or any of the lengthwise movements—are of the "same principle" as retruding the teeth—or any of the lateral movements—on the basis that both movements may be accomplished with similar devices from anchorages upon the same denture. Or one could claim that all of the intermaxillary forces—some of which have been employed for many years—such as wire and other ligatures for holding fractured jaws closed; intermaxillary springs for supporting artificial dentures; Wilder's intermaxillary socket-and-ball device for correcting irregularities, etc., are all of the "same principle" because they are dependent upon the opposing jaw for a sustaining anchorage.

Some time in the latter part of the '60's, Dr. Jerry A. Robinson of Jackson, Mich., with whom I was studying dentistry, tied a silk ligature from a partially erupted central incisor to a narrow strip of plate swaged to fit the labial surfaces of the lower front teeth, to which it was tied, for the purpose of bringing the tooth down to the occlusal plane. The patient was a boy about fifteen years of age who was living in his family. The ligature was cut at meal-times and replaced immediately afterward. It required only a few days, as the desired movement was not great; after which the tooth was tied to the adjoining teeth for retention. He did not claim that it was anything new or original, and I was led to believe that this was the ordinary way of correcting this malposition. But was it not the "same principle" that Dr. Angle employed in 1891, except that the latter used the excellent and important modification of *elastic* ligatures, which could be more conveniently adjusted and worn?

So one could keep on with this sort of reasoning to the profound and truthful conclusion that *all* movements of teeth, and devices for that purpose, are but *modifications* of some similar action or principle, as are all mechanical devices for the application of force everywhere but modifications of principles outlined in Newton's laws, and originally employed by nature and God, to whom consequently all the honor belongs. For that matter,

throughout all the ages since the advent of man, the elastic intermaxillary force has been constantly and successfully employed in the correction of malocclusion of the teeth through the action of the muscles; and moreover, by forcing the teeth into normal and interdigitating occlusion by a *reciprocal disto-mesial movement* of buccal cusps. I suppose there are in the world men so blinded with a little knowledge, with a tendency to rush in where angels are scarce, as to attempt to prove that this was but a modification of a principle originally employed by some man, if they could manage to antedate it by a string of half-told and adroitly juggled events.

From which may be gleaned the fact that *direct* intermaxillary force for the pulling downward of upper labial teeth is no more like the *disto-mesial* intermaxillary force for the shifting of occlusal relations of all the teeth, than are other forces whose actions differ both in principle, action, and direction.

SOME PROFESSIONAL COURTESIES AND OTHERWISE.

There was one very unusual coincidence in connection with this article by Dr. Dewey, which I shall leave my readers to elucidate: A few weeks after the receipt of the manuscript by the editor of the *Dental Review*, he also received the MS. of another article in attack upon me and my claims. Both of these were received during one month; both were along similar lines; and both were signed by Dr. Martin Dewey. The last one was so offensively personal in character that it was refused by the *Review* and afterward by the *Items of Interest* and by the *DENTAL COSMOS*, although (after being permitted to read the MS.) I urged these journals to publish it verbatim, and I also mailed similar requests to other journals should they receive it. My delay in answering the first of these efforts has been due to the feeling that I might be able to kill two birds with one stone, and thus save a lot of valuable time. The last one was in the form of an open letter "To Dr. Case." In one place it ac-

cused me of not remembering, "because you wanted to forget," that Dr. Angle was the originator of the intermaxillary force!

To show whether or not I have earnestly desired to give credit wherever it is due, one has but to read the published correspondence in the May 1904 *Cosmos*, in which I tried by every means in the power of a gentleman to obtain some authentic data for the origin of this principle other than that which I had so widely published years before; promising to "apologize publicly if I find that an apology is due."

The following circumstance will further show my intended fairness—which should put some of the published and unpublished accusations of Dr. Dewey and others to shame:

Soon after mailing the MS. of the article entitled "Origin, Use, and Misuse of the Intermaxillary Force"—which was published in the *Cosmos* for May 1904—in looking over some old journals I chanced upon Dr. Angle's article of September 1891, published in the *Cosmos*, entitled "Forcible Protrusion of Non- or Partially Erupted Teeth." I then remembered to have seen it in some of his later publications, but, like Dr. Angle, I had never associated it with that which we understand as "intermaxillary force." Thinking, however, that others might see a relation, I immediately wrote the following request to the editor of the *Cosmos*:

April 18, 1904.

Will you please insert the following paragraph at the *very head of my article*—or in a footnote at the bottom of *that page*, viz:

"In the September 1891 *Cosmos* Dr. Edward H. Angle published the unique method of bringing down impacted upper cusps with rubber ligatures attached directly to the lower teeth, and consequently he was probably the first to publish the application of the elastic intermaxillary force used in this way."

Dr. Kirk replied (April 22, 1904): "It comes too late for me to make the change you desire. I shall, however, write a brief editorial calling attention to the matter."

To this I wrote the following reply:

CHICAGO, ILL., April 25, 1904.

Dear Dr. Kirk,—Yours of the 22d inst. received. I am awfully sorry you could not make the change I suggested, especially that in reference to Dr. Angle.

I had known for some time that Dr. Angle published the use of rubber ligatures from impacted cuspids to the teeth of the opposing jaw, but had never associated it in the slightest degree with the principles of the "intermaxillary force" which I had been publishing. But just before writing you, in looking over some old *Cosmos*, I found much to my surprise that he had published it in 1891, and wishing to give him every credit that is his due, I immediately wrote you to fix my article as it would have been had I seen this before. Therefore, doctor, will you please be sure to quote me exactly in your editorial where I ask you, in a letter of April 18th, "to insert the following paragraph at the very head of my article," etc., followed with the paragraph; and greatly oblige.

The said paragraph duly appeared in the editorial columns of the *Cosmos*, and so far as I am able to learn it was the first time that Dr. Angle's device had been named an "intermaxillary force." Up to this time all of the members of the "new school," including Dr. Angle himself, had spoken of the disto-mesial action of this force, as the "Baker anchorage." And though Dr. Angle in one place claims it as a modification of his device, if he had really believed it to be the same "principle" when he published his book, would he have given the credit of its discovery to Dr. Baker in the manner that he did?

It should be remembered that at the time this was published (October 22, 1900) in the first edition of a text-book entitled "Malocclusion of the Teeth and Fractures of the Maxillæ" (which for some reason is called the "sixth edition") the "new school of orthodontia" was not born, and its prospective members, who may have been more or less acquainted with my earlier writings, had not discovered, or at least did not believe in the main uses of the intermaxillary force, which was pointed out to them later by Dr. Angle, and on this account was naturally regarded by them as a new and "radiant star" discovery.

In an address delivered by Dr. Angle

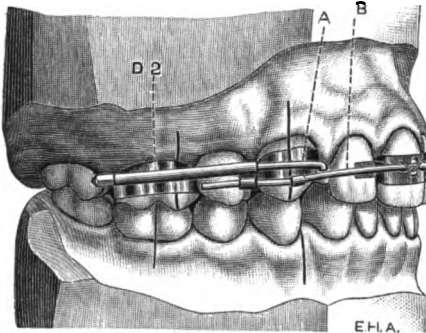
before the New York Institute of Stomatology on October 2, 1902, and published in the *International Dental Journal* for October 1903, in speaking of the possibilities of this force and the advantages of moving teeth to normal occlusion as opposed to extracting, he said: "This form of treatment I have been practicing now *but three years*, and so pleased am I with it in the large number of cases I have so treated that I no longer practice or believe in the plans that I formerly advocated," etc. This establishes the date of his first employment of the disto-mesial action of this force at not earlier than October 1899.

I have been credibly informed that the only practical use which Dr. Angle made of this force up to the latter part of 1900 was the same as that for which Dr. Baker had been using it, i.e. "jumping the bite;" and that it was Dr. L. S. Lowrie of Chicago, who was then a teacher in the Angle School, who first called his attention to the distal movement of molars, which led him to finally try the interstitial disto-mesial action of the intermaxillary elastics, and to the proclamation two years afterward of "the large number of cases I have so treated."

To prove that Dr. Angle did not recognize or appreciate the full possibilities of this force much before 1901 one may read his book ("sixth edition") from cover to cover, and he will find nothing in regard to this force except that in connection with Dr. Baker's "novel" employment of it. And though he here mentions its disto-mesial possibilities, he must have had little or no experience of its value in this regard, else he would not have advocated, as he does in the *paragraph immediately following* this description, *the extraction of the first bicuspid in a simple case of mal-eruption of an upper canine*, which he illustrates in his "Fig. 262" (see next page).

Of this sort of treatment I cannot help but somewhat irrelevantly remark that, years before this publication, many members of the so-called "old school" who had learned by much experience the powers of the intermaxillary force, would have considered this treatment the rank-

est kind of malpractice—as the illustration shows. Why? Because if the teeth are in normal occlusion upon one side and the facial outlines are not protruded,



—Angle. (Fig. 262.)

it is *prima facie* evidence that the mal-eruption of the canine upon the other side is due to a *local* cause, and probably to the premature loss of deciduous teeth, thus permitting the canine space to be closed, principally by a drifting forward of the buccal teeth to a malocclusion, and partially by a lateral shifting of the incisors toward that side, commonly followed with a contraction and consequent mal-alignment of the lower arch. Therefore all cases of this character *demand* that they be corrected without extraction by forcing the teeth back to normal relative positions and occlusion, thus opening the space for the eruption and normal alignment of the canine, else the adult facial outlines will be invariably marred. Let us hope that Dr. Angle will expunge this method of malpractice from his "seventh" edition.

SOME ACTUAL HISTORY.

Now let us turn back a few years and examine the earlier history, from authentic standpoints, of this much exploited and abused intermaxillary force. During the summer of 1891 I was consulted in reference to a case of regulating by Dr. Geo. W. Haskins, a prominent Chicago dentist and skilful orthodontist, who has filled a number of honorable positions as teacher and professor in the

dental schools of Chicago. The case was that of a lady about twenty-five years of age. The lower left buccal teeth had drifted forward, protruding the canine. The lower first molar had been extracted, leaving only one molar, which was too unstable to afford sufficient anchorage strength to force the bicuspid and canine back to a normal occlusion with the uppers, which the case demanded. In addition to a very ingenious appliance which the doctor had constructed I at once suggested the employment of intermaxillary elastics attached to the distal extremity of an upper molar anchorage—a method which (he will remember that I told him) I had employed in a number of cases of my own. Nor would I be surprised to learn that others, even years before this, had employed the same principle of force, because it is so simple, and the opportunity when suggested by the need is so evident that it would seem that any child might think of it.

Soon after the prominent introduction of this force by me, February 2, 1893, and later, I presume there were many others besides myself who began the extensive employment of it for the disto-mesial correction of malocclusion. Dr. A. E. Matteson, a prominent orthodontist of this city, writes me in answer to a letter of inquiry: "It is a fact that I was using the maxillary elastics quite extensively in 1894 for the correction of occlusion." In the same letter he gives the record of a number of cases of which he has the casts. He has since made the following statement:

I was present at the reading of Dr. Case's paper before the Chicago Dental Society February 2, 1893, in which he introduced for the first time two important principles of force for the correction of facial deformities, i.e. the anterior and posterior movement of the roots of the labial teeth, with what he termed the "contouring apparatus;" and the reciprocal anterior and posterior movement of the upper and lower teeth and jaws, with the intermaxillary force. I was exceedingly interested in the practicability of the intermaxillary elastic ligatures. In the discussion, Dr. Black put into my head the idea of employing this force for the disto-mesial movement of the buccal teeth for the correction of occlusion; the outcome of which induced me to at once

commence quite an extensive employment of this principle, both in my private and clinical practice. A record of these cases I am now prepared to show.

I then held the chair of orthodontia in the Northwestern University Dental School. In the fall of 1895, the university having absorbed the American Dental College, I resigned my position, and Dr. E. H. Angle, who was professor of orthodontia in the American Dental College, was continued at the head of this department, with Dr. J. N. MacDowell as his assistant; with the result that my clinical patients who were wearing the intermaxillary elastics were obliged to pass into the hands of the new *régime* for the continuation of their uncompleted work.

Dr. J. N. MacDowell, author of a textbook entitled "Orthodontia," and now professor of orthodontia in the Illinois University Dental School, has informed me that he remembers very well Dr. Matteson's clinical patients who came to the infirmary of the N. W. U. D. S. in the winter of 1895-96, and that some of these patients were wearing the intermaxillary elastics for the correction of malocclusion. When Dr. Angle's attention was called to these cases he ordered the appliances removed and replaced with his own, with the remark that that was some of Case's and Matteson's ineffective methods (which is to tell only a small part of this story).

From the above episode it is reasonable to infer that Dr. Angle *did* know of the disto-mesial employment of the intermaxillary elastics long before Dr. Baker told him of its effective action in "jumping the bite," notwithstanding his repeated publications to the contrary. If he disliked to admit that the honor of its invention belonged to the writer—in accord with his own statement in the preface of his book ("sixth edition"), "To fair minds recorded dates are usually sufficient evidence of priority"—why should he not have given it to Dr. Matteson, whose appliances utilizing this force he so peremptorily ordered removed, and which were placed there, as Dr. MacDowell has said, evidently for the purpose of a disto-mesial interstitial shifting of the buccal teeth to a normal occlusion? Or why should he not now give it to Dr. Haskins, who employed this principle in

1891? Or to Dr. Black, who suggested its wide possibilities in 1893?

I now wish to call attention to some of the evasions of truth which were employed for the sole purpose of establishing a false belief in regard to the origin of an important principle in orthodontia, leaving my readers to judge of the honesty and manliness of these methods. Space will not permit me, at this time, to detail the many examples of these efforts which apparently have arisen through the encouragement or instigation of the principals, and I will speak of but few of the many shameful attempts to suppress the truth by those who were in full possession of published data which established its validity.

SOME STATEMENTS BY DR. ANGLE EXAMINED.

The long correspondence that ensued between Drs. Angle, Baker, and myself, a part of which was published in the May 1904 DENTAL COSMOS, and which arose from an earnest endeavor on my part to find legitimate data—if it existed—for the term "Baker anchorage," speaks for itself as a striking example of evasion. Among the early replies to my many letters of inquiry is the following from Dr. Angle (November 17, 1903):

I am sure he (Dr. Baker) has been using his method of anchorage for fifteen years, as I saw patients in his office now grown up, on whom he used it in their childhood.

How long does it take for a patient of twelve or fifteen years of age, upon whom he would naturally apply this force, to "grow up"? The only case of Dr. Baker's which could possibly answer to the "patients" whom he said he saw was Dr. Baker's youngest son, Warren, who was "grown up," or eighteen years of age on August 21, 1899 (the year that Dr. Angle first commenced to use the so-called Baker anchorage for jumping the bite, as will be shown). But Dr. Baker does not say that Dr. Angle *saw* any of his patients at this interview. In his letter to me of November 24, 1902, he says:

When he (Dr. Angle) first came to see me about my system of orthodontia, I gave this

method to him, among others, as my invention. I informed him that I had used it with the very best results. He was a little skeptical as to its efficacy, but said he would try it, which he did in eight or ten cases before publishing it.

If Dr. Angle saw even the one case of Dr. Baker's son in 1899—after it was "grown up"—with its results as he published it in his book the next year, why should he be "skeptical as to its efficacy"? Moreover, Dr. Baker has said (as will be shown) that he corrected this case *in a few months' time*, and therefore it may have been corrected only a very few years before this event. *I am credibly informed that Dr. Baker did not practically employ the intermaxillary force in this or any other case until some time after November 1, 1895.*

Then why should Dr. Angle, with no real evidence whatever, say, "I am sure he has been using his method of anchorage for fifteen years." Would any man whom we would delight to honor make a broad statement of that kind with no evidence in his mind to prove it, and without some deep intent to deceive and silence me? Would such a man, in writing a text-book, give the whole credit of the origination of an important principle of force in orthodontia to one man, who had happened to tell him about it the year before, and not even mention the name of another who had widely published it eight years before, and in one instance at an International Dental Congress which he attended? He certainly must have known of it in the winter of 1895-96 when he ordered Dr. Matteson's appliances removed. Moreover, would such a man, in 1905, with every data of the truth before him, and fully conscious of his own words—"To fair minds recorded dates are sufficient evidence of priority"—publish in his chapter in the "American Text-book of Operative Dentistry," third edition, the foot-note on page 753?

SOME REMARKS ON DR. H. A. BAKER.

Now let us turn to a few of the acts of Dr. H. A. Baker of Boston. In one of his replies to my request to—"Kindly di-

rect me to the periodical or text-book" where he "first published the idea" of the intermaxillary force, he gave as one reason for his refusal that it "*would be considerable trouble in looking up the records of the different societies throughout New England.*" Yet he KNEW there was only one time and one place that he had publicly mentioned this method of force, and then in a very incidental and problematical manner, with no appliances or even drawings of the device, but merely as *something he was going to try* (as will be shown); and in no wise was it in the sense of bringing before a society an original idea of value, for the purpose of having it recorded as a new device as he has claimed. In fact, as he made no claim at this time to the originality of this principle of force, it is natural to presume that he obtained the idea from the two prominently presented papers in which it was described months before. His mention of it occurred at one of the regular monthly meetings of a Boston local society—"The American Academy of Dental Science"—on Wednesday evening, December 6, 1893.

The subject of the evening was "Orthodontia," and consisted mainly in a discussion of Dr. Geo. C. Ainsworth's methods of regulating teeth (which Dr. Baker had adopted) and Dr. Baker's methods of retention. Dr. Baker opened the subject as follows: "Mr. President and gentlemen,—Dr. Ainsworth and I *do not claim to bring anything new before this meeting.*" Here followed quite a lengthy discourse upon a system of regulating proposed by Dr. Ainsworth, which had nothing to do with intermaxillary force; and a spur method of retention by Dr. Baker.

The only reference which could be construed as relating to the intermaxillary force during the entire evening occurred while Dr. Baker was exhibiting the models of cases. And as this incident is absolutely the only evidence upon which can be made to hinge the right to apply the term "Baker anchorage" to the intermaxillary force, I will quote the whole of this record exactly as it appeared under "Reports of Society Meetings" in the

International Dental Journal for April 1894, that the reader may see how very unimportant he considered the intermaxillary feature of this exhibit:

Nearly all these cases have been regulated by means of Dr. Ainsworth's band. This case has a right central turned a quarter way around, and a right cuspid placed outside of the arch. The irregular teeth are now in good line, and held in position by spurs. Here is another case which is very much out of line, both as regards the upper and under teeth; the upper ones only have been regulated, and are now held in place by retaining spurs. Here is another case, in which the right cuspid is very much out of line, and the arch contracted. In this case I used the band in connection with the spur as a retainer. This case shows a separation of the front teeth. The under teeth seemed to throw the upper ones out, making a space of about one-sixteenth of an inch between the incisors. This condition was corrected by the use of the band, which threw back the front teeth, both upper and lower. These teeth were retained in position by a wire hook passing around the upper centrals. I do not claim that they will remain in place. There is a cause for the separation of these teeth, and I do not know whether or not there is any remedy for it. I have here a bad case of protruding upper jaw, or a much receding lower one. This case is in my own family, and no one wishes it corrected more than I do. My plan of treatment is to put in place bands on both upper and lower teeth, and spread the arches by tying to the bands all the teeth in front of the molars. Then to take four square nuts and solder a hook to each, and screw them on to the bands. Elastics are to be slipped over these hooks. The child is to wear the appliance constantly. You will see that the tendency of this arrangement will be to draw the upper jaw back and the lower one out, and so jump the bite. I don't know whether this apparatus will interfere with eating or not. I will try to explain on this model how teeth are retained by spurs. The right central and right lateral are both twisted. The right central was turned to place, and a spur put in the mesial surface of the right lateral, the spur holding the central in place. After twisting the right lateral to place, it was retained by drilling into the distal side of the right lateral and putting in a spur which rested on the cuspid. Another spur in the mesial surface of the right central rested on the palatal surface of the left central.

The few indefinite and doubtful remarks in the above quotation in regard to

the intermaxillary force are the only ones I have been able to find which Dr. Baker made before any dental society, up to his paper of nearly ten years afterward, to which I shall refer later.

At the time of the said meeting in Boston, Dr. Baker was practicing dentistry in the office of Dr. Ainsworth. I am credibly informed that the models of his son's teeth to which he referred were at some time after the meeting set up on an articulator with the intermaxillary elastics tied to appliances constructed by the elder Dr. Moffit, in which state they remained on Dr. Baker's desk, and were *not put into practical operation during the time he remained in that office*—which he left November 1, 1895.

At the meeting of the Stomatological Society of New York City, January 6, 1903, Dr. Baker presented the first and only paper that he has ever written relative to the intermaxillary force. This was published in the *International Dental Journal* for May 1904.

In speaking of the origin of the method he says:

My youngest son was afflicted with a very pronounced case of protrusion and recession of the jaws, for which I studied out a course of treatment which I thought would be effective. I brought my study model before the American Academy of Dental Science, and explained my method; *after which* I proceeded as I explained, and carried the case through.

Farther along in his paper he says:

While studying these models, by sliding the lower jaw forward so that the sixth-year molars would be in a normal occlusion, I found that with a very little spreading of the arches and slightly retracting the upper incisors I would get proper occlusion. By close observation we noticed the deformity is confined to more of a recession of the lower jaw than protrusion of the upper. As the correction requires very little tooth-movement and considerable forward bodily motion of the lower jaw, it was a great problem to me what force to apply to produce this result. . . . I took my models before the American Academy of Dental Science and explained my method of procedure, requesting it to be put on record as a new device for correcting protruding and receding jaws. I commenced the case in the spring of 1893. I was astonished with the result. In two months' time the

teeth were occluding in a normal position; but for fear that they might return to their former position, I reduced the size and strength of the elastics and kept them in that way several months longer, and by so doing they settled into perfect occlusion. The next step was to retain them.

Though he twice refers to the event of his bringing the idea before the American Academy of Dental Science for the purpose of recording the origin of this method, yet he studiously avoids stating the *date* of that meeting, thus with the apparent intention of leading one to infer that the meeting must have occurred some time before 1893, as he claims to have "commenced the case in the spring of 1893"—but *after* the said meeting, at which time he said, "I don't know whether it will interfere with eating or not." As this meeting did not take place until December 6, 1893, according to his own acknowledgment he could not have commenced the case before the spring of 1894. And as it took him only a few months to complete the operation, he may not have commenced the case until the spring of 1896, and still have had plenty of time to show it to Dr. Angle in 1899, when the patient was "grown up" (which is somewhat less than "fifteen years").

I do not say that Dr. Baker's idea of the use of the intermaxillary elastics did not originate in his own mind. That would not be so very strange. But it nevertheless is not a far cry to say that on December 6, 1893, when he told how he intended to try the method as an auxiliary to other forces in the regulation of his son's teeth, it was not impossible, or even unnatural, that he should have already heard of it from the two papers read at prominent dental societies during the earlier part of that year, in which this principle was fully described and illustrated, and which he may have had in mind when he said, "I do not claim to bring *anything new* before this meeting."

REDUCTIO AD ABSURDUM.

Now, note—First: The difference in the time and character of the two pre-

sentments of this principle by Dr. Baker and myself.

Second: The fact that the principle was repeatedly referred to by me during the two subsequent years, in papers read before the most prominent dental societies of America, whereas with the exception of the event December 6, 1893, and the fact that he "told" Dr. Angle about it in the latter part of the '90's, there is no record of any attempt on Dr. Baker's part to publish the method until after January 6, 1903.

Third: At the time and before Dr. Baker practically applied this principle for jumping the bite in the regulation of his son's teeth, a number of prominent orthodontists were extensively employing it in their practice for the disto-mesial interstitial shifting of occlusal relations of the buccal teeth, in exactly the manner and for the same objects which many have been led to imagine originated very much later with the "new school"—in which it forms the foundation of all that can be claimed as new.

Fourth: The first employment of this principle of force by Dr. Angle, according to his own words, was not earlier than October 2, 1899, and then for a year or more he used it principally, if not solely, in operations of jumping the bite.

When all of these truths are calmly considered, do they not make Dr. Dewey's statements sound silly? And yet I am informed that he is a man of considerable intelligence and a pretty good all-round fellow, when allowed to think and speak for himself.

I had hoped that my first defense—the truths of which have now stood for three years unchallenged—would be considered sufficient to stop these ridiculous vauntings, but as that evidence has been completely ignored in certain quarters, with a constantly increasing tendency to suppress and pervert the truth, it is with the deepest regret that I am now forced to publish such a shameful commentary on professional honor and ethics.

SETTING CROWNS AND BRIDGES WITH GUTTA-PERCHA.

By L. G. NOEL, D.D.S., Nashville, Tenn.

(Read before Section I of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

IN crowning teeth whose roots have been in a condition of septic inflammation, a method of setting crowns that will admit of easy removal for further treatment has been earnestly desired, but not yet fully realized.

Other conditions may arise aside from dento-alveolar abscess or pericemental inflammation rendering it desirable to remove the work, such as a fractured facing or a desire to make changes in occlusion. Removal is well-nigh impossible when the work has been attached with zinc oxyphosphate cement.

Gutta-percha possesses qualities that recommend it especially for either permanent or temporary settings, being readily softened by the application of heat; but the obstacle in the way of its general adoption has been the difficulty of dissolving it so as to obtain it in a cement-like consistence.

Nothing can be more disappointing than a failure to carry to place a crown or bridge which has been carefully adjusted, for this will certainly derange the occlusion. The difficulty has been stated with almost all the preparations of gutta-percha with which your essayist has experimented, except the old solution in chloroform, which is too unsatisfactory to merit a second trial. It shrinks notably when the solvent evaporates, leaving a mere string in the canal, which furnishes no support to the work.

Encountering these difficulties, I set to work, hoping to obtain a solution that would have sufficient body to control the shrinkage and at the same time possess an easy flow under pressure, like that of soft cement. I think I have succeeded in obtaining a fairly good solution, and

with it have had results that have been highly gratifying to me. I offer it to you for what it is worth, fully realizing that is by no means perfect, and that my own experiments are too recent to go on record as final. I hope you will take it up and give it a trial. Perhaps some of you will improve upon my ideas, in order that we may thus arrive at something truly good.

At present, I am proceeding as follows. Make the following solution of gutta-percha:

Chloroform,		
Oil of eucalyptus,	āā f3j;	
Aristol,	gr. xx;	
Gutta-percha, q. s.		M.

This solution should be made in a wide-mouthed bottle and the stopper smeared with a little vaselin to prevent the evaporation of the menstruum, and also to make it easy of removal. It will take about a week to obtain a satisfactory solution of the gutta-percha, and it should be stirred from time to time until all lumps have disappeared, adding more gutta-percha, if necessary, until a creamy consistence is obtained. I prefer the red base-plate gutta-percha cut in small pieces.

As the mercury sulfid which this variety of gutta-percha contains renders this preparation to a certain extent antiseptic, apart from the aristol, which is markedly antiseptic, no trouble will arise if a little should be forced through the apical foramen.

Now, when ready to set a crown or bridge, pour a sufficient quantity of this solution upon a slab, and with a strong spatula work into it a quantity of white zinc oxid, spatulating it thoroughly, and

adding a little of the powder at a time, until the consistence of cold butter is obtained. The root-canals may now be filled by carrying in small quantities of it at a time with smooth broaches; the caps and crowns should also be filled, and the work carried to place.

This preparation has a smooth, oily, butter-like flow, and the excess will escape easily from the caps and crowns. The powder accompanying the zinc oxy-phosphate cement will do as well as the

pure zinc oxid. The gutta-percha undergoes a hardening process as time passes. This has been said to be a process of vulcanization, as it seems to be something more than a mere evaporation of its solvent. If it become desirable to remove the work, a little heating of the gold by applying the bulb of an Evans' root-canal dryer, which has been previously heated in a Bunsen flame, will soften the gutta-percha, and the work can be readily pulled off.

METHOD OF TAKING IMPRESSIONS FOR PORCELAIN AND GOLD INLAYS BY MEANS OF STRIPS OF ALUMINUM IN COMBINATION WITH DENTAL LAC.

By IRA G. BAUMGARDNER, D.D.S., São Paulo, Brasil.

THE unsatisfactory results often obtained by the burnishing of platinum into cavities for forming matrices led the writer to experiment in taking impressions by means of dental lac. The idea was not a new one when applied to buccal restorations or cavities of direct approach, and for these the manufacturers supply cups or forms nicely adapted to the purpose; but for approximal or compound cavities, no adequate solution has been offered to meet these requirements.

Dental lac is a most excellent material for impression work, giving a faithful image of cavity and margins, and reproducing in the die of inlay metal a perfect counterpart of the cavity; but the question was how to use it in approximal cavities in the absence of a proper vehicle to confine it. Cloth polishing tapes were tried, a small button of lac being warmed and attached; the strip was then drawn between the teeth and pressed to place; but this, however, did not afford the necessary rigidity. Strips of German sil-

ver and brass, very thin and well annealed, were likewise tried, but their springiness would not allow the lac to set in place and stay set. Finally, aluminum was tried, and unfailing success with it during the past two years has encouraged the writer to recommend its use in taking impressions for stamping the matrix, and as being applicable to all cavities in the interproximal space, of whatever shape or position.

Aluminum when well annealed is softer than lead, can be rolled to the thickness of paper, and when bent remains in the position to which it has been adapted, and by its use, in combination with dental lac, an inlay of gold or porcelain can be placed with comparative ease (having the necessary separation) in approximal cavities in the molars, if so desired.

Strips of aluminum plate are rolled out to No. 34 gage—and thinner if desired—cut in lengths of about $1\frac{1}{2}$ inches, and in width slightly larger than the cavity measured from the gingival to the

occlusal wall. (Fig. 1.) When the cavity extends to or under the gum, the strips are cut with an extension (Fig. 2), to insure the lac reaching and recording

cessity to press away the gum with cotton or gutta-percha beforehand, as the gum extension on the strip, passing beyond the limits of the cavity, will give in the

FIG. 1.



Plain aluminum strip.

FIG. 2.



Aluminum strip with gum extension.

FIG. 3.



Aluminum strip with occlusal extension.

FIG. 4.



Aluminum strip with gum and occlusal extensions.

this margin. In all cavities involving the biting edge, whether in the anterior teeth, the bicuspid, or the molars, or where corners are to be restored, an occlusal extension is cut and bent over at a right angle (Fig. 3), in order to include the occlusal surface.

lac a perfect impression of this margin, so difficult of attainment by burnishing the matrix.

In taking the impression the cavity is first moistened with cold water. Then to the center of an aluminum strip—cut to requirements—is attached, by gentle

FIG. 5.



Strip and impression of cavity.

FIG. 6.



Inlay on die of inlay metal ready for undercutting or etching.

Good separation is, of course, always desirable for porcelain work, but for this method very little, if any, additional separation is needed beyond that required for the burnishing process. One great advantage in the use of these aluminum strips will be found in cavities extending to or under the gum, for unless the gingival wall is seriously lost, there is no ne-

heat, a button of dental lac—a quantity just sufficient to fill the cavity and give a slight marginal excess, and covering well any gum or occlusal extension—and after heating in a spirit lamp to the desired plasticity, the strip is drawn between the teeth, and the lac firmly pressed to place, the ends of the strips being drawn round palatally or buccally,

if these walls are involved. When an occlusal extension is used, an assistant is necessary to press this down with a blunt instrument, in order that the underlying lac may be well adapted. After a half-minute for setting, cold water is poured from a syringe, the pressure is released, and the impression removed. (Fig. 5.) The ends of the strip are snipped off close to the lac impression, and it is then embedded in moldine and is ready for pouring the die of inlay metal, followed

by the stamping process. If a platinum matrix be stamped from the die, no further trying-in is necessary, unless to verify contour or shade until the porcelain or gold inlay is ready for insertion; for if the procedure of taking the impression has been carefully carried out, the inlay will fit. (Fig. 6.)

The simplicity of the method makes it a time-saver in impression-taking, and with an entire absence of strain on the patient or operator.

PROSTHETIC NOMENCLATURE.

By **GEORGE H. WILSON, D.D.S.,** Cleveland, Ohio.

(Read before Section II of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

ALL agree that dental nomenclature is imperfect; but there is considerable variance of opinion as to how it can best be improved.

As any language consists of the diction of its best authors and teachers, so the phraseology of a profession consists of the diction of its authors and teachers. The permanence of a vocabulary depends upon the accuracy of the formation of words and whether they best express the thought for which they are used. There are words in the dental vocabulary universally used that cannot endure for all time because their literal meaning is entirely foreign to their accepted use. As illustrations "canine" and "arch" are cited. "Canine" is now discarded by a very respectable portion of the profession; later we shall show wherein "arch" is an inappropriate word as now applied.

Modern dentistry is a young profession and still in a formative state, but far enough advanced for much good work to have been done toward perfecting its nomenclature. The work of Dr. Black pre-

sented at the Second International Dental Congress in 1893 and the reports of Dr. Guilford and his committee to the American Dental Association in 1895 and 1896 were an excellent foundation for this department of dental education.

There seems to be a lack of courage with some of our most ardent workers in this department of dental knowledge; so much so that they advocate compromise with error for the sake of harmony. (See report of the Committee on Nomenclature in the Transactions of the Fourth International Dental Congress.) There can be no permanence established upon compromise, only time and labor lost. Therefore any changes advocated to give assurance of endurance must be scientifically considered and must be the very best known to the professional mind. Prejudice, pride, and euphony should all give way to philology; then, and then only, can any permanent work be accomplished.

The argument has been made that we cannot legislate a nomenclature into ex-

istence. This is true, but we can do what will be its equivalent in a few years. The National Dental Association and the National Institute of Dental Pedagogics include in their membership the authors and teachers of the profession, therefore a well-considered vocabulary adopted by them will be adopted by the three avenues of education—the schools, the journals, and the writers. After a few years the old, who cannot learn, will have joined their fathers, and the improved vocabulary only will be in existence. If the dental profession has a vocabulary bearing the official stamp of its two national bodies, it will undoubtedly be adopted whenever there is a revision of our standard literary and medical dictionaries.

Appended to this paper [p. 460] is a list of words especially used in prosthesis. They are arranged alphabetically and are marked to show when approved by the Standard and Gould's dictionaries. The pronunciation is that of the N. D. A. committee of 1895-96, as given in their list. If there is a special dental application of the word, credit is given for the definition to the person responsible for its existence, when known by the writer. Many of the words listed need no comment, while others require discussion. The words for special consideration will not be taken up in alphabetical order but as they seem to the writer to group themselves.

Various names have been applied to this department of the profession: Prosthesis, Prosthetic Dentistry, Prothetic Dentistry, Prosthodontia, and Mechanical Dentistry.

Pros'-thes-is—Standard and Gould; *pros'-the-sis*—committee of 1895. Gk. *pros*, to, *tithemi*, to place. Defined: The making of artificial parts and fitting them to the body, as artificial teeth, cork legs, glass eyes, etc.

What authority the committee of 1895 had for changing the pronunciation from "pros'-thes-is" to "pros'-the-sis" does not appear, but certainly it is much easier to pronounce and should be adopted.

This noun was probably long used by the medical profession before it was taken up by the dental, but its use is

very limited by the mother profession compared with the dental, therefore it seems no presumption for the latter profession to appropriate and give it a special significance. It is comparatively a short word, and is that generally used throughout the profession, especially in its adjective form, to denote making and inserting artificial dentures. It is a general term, therefore is capable of assuming any shade of meaning the age may require; hence it is the best term yet suggested for this branch of the profession.

Definition: Prosthesis is the science, art, and esthetics of restoring a lost dental organ or organs and associate parts with an artificial substitute. Science is the theoretical knowledge of the subject, art is the skilful doing of the work, and esthetics is the idealizing or harmonizing of the restoration.

The term or name accepted should not be confined to the teeth, because to-day they are only a small part of what is covered by this department of dentistry. Appliances for cleft palates, dental splints, and even lips and noses may be required of the dental prosthetist. However, the most important esthetic service the dentist is required to render is to restore the contour and expression of the lower third of the face.

Pros-thet'-ic dentistry. A proper term, but long, and one rarely necessary, especially if the appropriating of "prosthesis" is approved.

Pro-thet'-ic dentistry. "Pro-thet'-ic," adjective form of "proth-es-is," Gk. *pro*, before, *tithemi*, to place. A term rarely used, and it should not be put in the dental vocabulary.

Pros"-tho-don'-tia. From two Greek words, *prosthesis* and *odontia*, meaning "to place" "tooth," but as applied to dentistry the word is made to cover all work done by the prosthetist.

The derivative is good, but literally it calls attention to the smaller part of that to which it is applied; therefore it is misleading and tends to make ignoble this most complicated and difficult part of our profession.

Mechanical dentistry. The first name given to prosthetic dentistry; but it

should now be restricted to the work done in the laboratory, whether for the prosthodontist, orthodontist, or operator. The mechanical dentist works for the dentist, not for the patient.

"Cast" and "model" are terms that deserve careful consideration.

Cast. The Standard Dictionary defines cast, under the heading mechanics, as "A reverse copy, in plaster of Paris or similar material, of a mold; usually distinguished from a *casting*, which is of iron or other metal or alloy. An object founded or run in or as in a mold, as of metal, plaster, wax, etc."

In dentistry, "cast" may be defined as: A reproduction in plaster of Paris or its compounds of an object, or part, made from an impression or mold. Casts are used to give their negative likeness to an artificial denture, while a "model" is to produce a positive likeness.

Model. From Lat. *modus*, measure. An object representing accurately something to be made or already existing. A material pattern of natural, heroic, or diminutive size. In sculpture, the plaster or clay original of a work to be executed in stone or metal. One who does duty as a copy or pattern for painters or sculptors. A sculptor may idealize his living model; but his workmen must exactly copy the model he has made in clay. (Standard Dictionary.)

In dentistry: A plaster model is used to make a metal casting or die. Wax models are to be reproduced, or their outlines retained in the completed work. Models are extensively used in technic work. Plaster models are never used in vulcanite work. "Model" is often improperly used for "cast."

Dental arch. The term applied to the curve made by the upper or lower teeth.

"Arch" is not an appropriate term to be applied to the alinement of the dental armament, because when the teeth are in normal use they are in a horizontal position, while arch conveys the idea of perpendicularity, and is too often applied to the vault of the mouth. The writer would suggest, as a substitute for "dental arch," *dental curve*. A curve is a

line continuously bent so that no portion is straight; a line that everywhere changes its course. In medicine, "curve" is used once—"curve of Carus" (in obstetrics).

Dental curve would be defined thus: The curve or bow formed by the alinement of the teeth. The different portions of the dental curve would be called and described as—

Alinement curve. The line passing through the center of the teeth mesiodistally.

Labial curve. From cuspid to cuspid.

Buccal curve. Buccal surface from the cuspid to the distal surface of the third molar.

Compensating curve. Occlusal surface of bicuspids and molars.

"Curve" would better convey the idea of an imaginary line; when "arch" is used, too often the teeth or even the alveolar process is meant, instead of the line described by the teeth.

Cuspid. This is an anatomical term, but because of its great importance in teaching and practicing prosthesis it seems apropos to discuss it in this place. "Cuspid" is derived from Lat. *cuspis*, point, and is applied to the four conical or pointed teeth. The name is descriptive and not confusing, it is short and not offensive to refined taste. It is certainly the most desirable one of the four names struggling for an existence—cuspid, cuspidati, canine, and eye-tooth. It is true that our standard anatomists cling quite tenaciously to some of the terms of the dark ages, but that is no reason why a modern science should adopt a faulty diction when a better one may be had for the choosing. Many of the schools are today using the term exclusively; it is quite possible that cuspid is more extensively used by the profession today than canine. If the term cuspid be adopted as the name for the third tooth from the median line in the dental armament, then consistency will require that we shall call the eminence and fossa cuspid; but the terms will be self-explanatory, so that no real objection can be urged upon that score.

Dummy. In common use in the den-

tal profession as a name for the substituted teeth in a bridge. The word dummy is not found in the vocabulary of Gould's Medical or Harris' Dental dictionaries, nor is the word given a dental significance in the Standard. As applied it is a meaningless and clumsy term.

At the 1905 meeting of the National Dental Association, Dr. W. Storer How used and indorsed the term *Substitute*, and its abbreviated form "sub," for the teeth filling the span of a bridge. This term is certainly worthy of consideration.

Flasking. In cast-metal dentures the cast and model plate are incased in a flask with a suitable compound; in vulcanite and celluloid work the cast and model plate are incased in a flask with plaster of Paris, and this is called flasking and the work is said to be "flasked." Solder work incased in a protecting substance without a flask is said to be "invested."

Flexible vulcanite. The 1896 committee preferred "flexible vulcanite" to "velum rubber," and defined it as: Vulcanite which is soft and extremely pliable after vulcanization, containing less sulfur than hard vulcanite.

All rubber when perfectly vulcanized is more or less flexible, therefore the term "flexible vulcanite" is confusing. "Velum rubber" before the application of heat, and "velum vulcanite" after the application of heat, leaves no question in the mind of the dentist as to what is meant, and, it seems to the writer, should be accepted as the choice until something better is suggested.

The committee of 1896 included in their definition, "and being vulcanized at a lower temperature than hard rubber." This implies a mistaken idea, as the temperature in vulcanizing either variety should be the same—the thickening of the mass, only, governing the temperature. The velum rubber will require less time to be converted into vulcanite because there is less sulfur to combine with the hydrocarbon; but no harm is done if the velum rubber be subjected to heat the full length of time required for hard vulcanite.

Impression. An imprint of the eden-

tulous ridges and palate, or teeth, in some suitable material, such as beeswax, modeling compound, or plaster of Paris. (Com. 1896.)

A new definition of *impression*: A negative likeness of an object or part taken in a plastic material, from which a cast or positive likeness may be produced.

Impression tray. "Tray" preferred to "cup." "Cup" conveys the idea of symmetry of form with a base on which to stand, and holding capacity; while "tray" conveys the idea of indefinite form, a utensil having flanges, and capacity to hold and carry.

Line. Any slender mark or band.

Median line. An imaginary line on the surface of the body between opposite symmetrical halves. The middle line dividing the teeth. (Black.)

Lip line. The line defined by the lips closed and at rest.

High lip line. The line defined by the upper lip when elevated to the extreme by muscular action.

Low lip line. The line defined by the lower lip when depressed to the extreme by muscular action.

Maxillary. Pertaining to the maxillæ or jaws.

Maxillary surface. The surface of a tray, impression, or artificial denture that rests upon the maxillæ, either upper or lower. (O. A. Weiss.)

Abutment. In mechanics, any relatively immovable part. Dental: The anchor tooth for a bridge. Preferred to "pier" or "anchor."

Abutment crown. The part of a bridge attached to the abutment. Preferred to "anchor" or "pier" crown.

Abutment used as a noun refers to that to which the bridge is attached; the adjective refers to that by which the bridge is attached.

Porcelain (pōrs'-lān). Pottery is divided into three classes—earthenware, stoneware, and porcelain. Porcelain is subdivided into three classes—hard, natural soft, and artificial soft. Dental porcelain belongs to the subdivision *hard* porcelain. Hard porcelain is kaolin and quartz with a feldspathic glaze.

Dental porcelain may be defined as: A

solidified suspension of one or more unfused silicious substances in a fused silicate.

Porcelain is high- or low-fusing, dependent upon the quantity and quality of its basic ingredient. Any hard porcelain becomes glass when there is fusion of all its essential constituents.

Sweat. To send forth, exude, or perspire. Applied in dentistry to the uniting of two pieces of metal by heating and without solder. It is not euphonious, but describes the operation.

Autogenous (au-tog'-en-us). Gk., self-producing. The method of soldering to which this term is applied is brought about by high heat, therefore is not self-producing. This term was preferred by Dr. Guilford in his paper on Nomenclature at the Fourth International Dental Congress.

Weld. To unite or consolidate. This term implies uniting with force, either with or without heat. It should not be used as synonymous with sweating and autogenous soldering.

While the words are not pleasing, the writer believes that "sweat" and "sweating" are the best, because they describe the operation.

Resorption. A term that should be used by the prosthetist, and not "absorption" of the alveolar process. Absorption is best applied to the physiological process of adding nourishment, while resorption best describes the pathological and physiological processes of removing waste tissue.

VOCABULARY.

[St. = Standard Dict. G. = Gould's Medical Dict.]

Absorption. [St., G.] *Absorb*, to drink in or suck up. *Absorption*, the act or process of absorbing; the condition of being absorbed.—*St.*

The process whereby nourishment, medicine, morbid products of tissue metamorphosis, etc., are taken up by the lymphatics and various systems.—*Gould.*

Preference is given to *absorption* for taking up nourishment, and *resorption* for taking up waste products. (See *Resorption.*)

Abutment. [St.] Arch.: A supporting or buttressing structure to sustain lateral

pressure. Mech.: Any relatively immovable part.

The anchorage tooth for a bridge.—*W.* (Preferred to *Pier*, which see.)

Adhesion. [St.] Physics: A molecular force, or the result of it, by which certain bodies stick together.

The force that retains full upper dentures without vacuum chambers.

Air-chamber. [St.] A chamber or inclosed space containing air.

Improperly used for vacuum chamber in artificial dentures.

Alinement (1), *Alignment* (2). [Both forms, Cent. and St.] The line to which adjustment is made.

Orderly arrangement of the teeth.—*W.*

Alloy. [St., G.] A compound or mixture of two or more metals; commonly restricted to compounds of metals produced by heat.—*Com.* 1895.

A compound of two or more materials by fusion. The least valuable of two or more metals that are fused together.—*Gould.*

Anterior. [St., G.] Applied to the six front teeth in either jaw. Preferred to "oral."

Arch. [St.] In dentistry applied to the curve made by the upper or lower teeth. Sometimes wrongly applied to the vault. (See *Curve.*)

Articulate. [St.] To join together.

Articulation. [St.] Any form of a joint; the union forming a joint, as of bones.

Special: To so arrange the artificial teeth as to accommodate the various positions in the mouth, or "anatomical articulation."

Articulator. [St.] A dentist's apparatus to secure correct articulation in artificial teeth. (See *Occlude.*)

Artificer. [St.] One who constructs, especially with skill; a craftsman; mechanic. Artificer preferred to "mechanical man."—*W.*

Artificial crown. A crown of either porcelain or metal, or both; to be adjusted upon the root of a natural tooth.—*Com.* 1896.

Artificial teeth. A dentist's imitation of natural teeth.—*Com.* 1896.

Artificial velum. An appliance composed of flexible vulcanite, used in the mechanical treatment of fissures of the soft palate.

Asbestos. [St.] A fibrous silicate of calcium and magnesium.—*Com.* 1896.

Autogenous. [G.] (Gk., self-producing.—*Gould.*)

Applied in dentistry to uniting metal without solder. Preferred by Dr. Guilford. (See *Weld* and *Sweat.*)

Babbitt metal. Dental formula (Haskell):
Sn 8, Cu 1, Sb 2 parts.

Band. A thin metal hoop used to encircle a natural tooth or root.—*Com.* 1896.

Base metal. [St.] *Com.* 1896. Not of the noble metals. Any metal except Hg, Au, Ag, and the Pt group.—*W.*

Base-plate. That part of an artificial denture which supports the artificial teeth and to which they are attached.—*Com.* 1896.

A foundation next to the gum, for artificial teeth.—*St.*

Bellows. [St.] An implement for creating a blast of air.

Bite. [G.] The act of biting. Seizure with the teeth or mouth. (Anglo-Saxon root meant *split*.) Applied in dentistry to a plastic material which has the imprint of the teeth or gums of both jaws; used in constructing artificial dentures. (Inelegant term.)

Bridge. [G.] *Bridge work*—The adaptation of artificial crowns of teeth to and over spaces made by the loss of natural teeth, by connecting such crowns to natural teeth or roots for anchorage by means of a bridge, and thereby dispensing with plates covering more or less of the roof of the mouth and alveolar ridge.—*Gould.*

A method of dental substitution that does away with the customary base-plate, the artificial teeth spanning the edentulous space with attachments to natural teeth at one or both ends of the space.—*Com.* 1896.

Bridges are "fixed" or "removable."

Bridges are attached to *abutments* by—Bands; crowns; open-faced crowns; bars; inlays; hoods; pin-and-sockets; telescope crowns; lugs.

Bridges are sometimes supported by "abutment saddles."

Bridges are—Porcelain; gold with porcelain facing; all gold.

Caoutchouc. [St.] Indian name for india-rubber. A hydrocarbon. When combined with sulfur and subjected to heat it is converted into vulcanite.

Cap crown. Synonymous with shell crown. Given by *Com.* 1896. It should be dropped from dental nomenclature.—*W.*

Carat. [St.] A twenty-fourth part. *Carat* is the spelling preferred by S., C., E., W., Wr., Imperial, etc., and fifty of the fifty-seven Advisory Committee.

Karat—C., 2d choice; Dr. Butler and Melvil Dewey give it first choice. It seems best to adhere to *carat*.

Carborundum. *Com.* 1896. Carbide of sili-

con, SiC. (Not in Gould's dictionary 1896 or Standard 1899.)

Cast. [St.] (Verb, To shape in a mold; make a cast of.) A reverse copy, in plaster of Paris or similar material, of a mold; usually distinguished from a *casting*, which is of iron or other metal or alloy. The material run into molds at one operation.—*St.*

In dentistry: A reproduction in plaster or its compounds of an object, or part, made from an impression or mold. Casts are used to give their negative likeness to an artificial denture, while a model is used to produce a positive likeness. (See *Model*.)

Celluloid. [St., G.] Made by subjecting gun-cotton (pyroxylin) mixed with camphor to hydraulic pressure. An imitative substitute for ivory. Other names are "Rose pearl," "Zylonite," "Pyroxylin," etc. Sometimes used as a base for artificial dentures.

Clasp. [St., G.] A piece of spring metal, usually platinum gold, adjusted to three sides of a tooth with one or both ends free, and designed to support partial dentures or other apparatus to be worn in the mouth.—*Com.* 1896.

Collar crown. [G.] An artificial tooth-crown mounted upon and attached to a base composed of a metal ferrule and cap, and designed to cover and rest upon a natural root.—*Com.* 1896.

Preferred name for the crown often called the Richmond crown.

Contour. Con-tour—S., C., E., W., Wr., Imp.; con'tour—C., 2d. The line bounding a figure or body.

In prosthesis (verb): To make the normal or natural outlines of a tooth; or to construct a denture so as to restore the normal or natural outline of the contiguous soft tissues.

Corundum. [St.] A very hard native crystalline alumina.

Counter-die. [St.] The reverse image of a die. Usually made of a softer and lower-fusing metal than the die.

Cross-pin teeth. Artificial teeth in which the pins are arranged parallel with the transverse diameter of the teeth. In contradistinction to *straight-pin* teeth. (See *Teeth*—straight-pin.)

Crown. [G.] The exposed portion of a tooth.

Artificial crown: A restoration of the crown of a tooth with porcelain, metal, or a combination of the two.

Crowns are—Porcelain; porcelain jacket;

metal—shell (seamless, sectional, or in two pieces); solid; porcelain-faced.

Crowns are—Collar; dowel; collar and dowel.

Sectional shell crowns consist of—Band (lap or butt joint) and cap—die-and-counter swaged; carved and swaged; die-plate swaged; cast.

Crowns have—Attached or fixed dowels; detached dowels.

(Dowel-pin is the same as dowel.—*St.*)

Curve. [*St.*, *G.*] A line continuously bent so that no portion is straight; a line that everywhere changes its course.

Dental curve. Defined: Curve or bow of the teeth. The different portions of the curve would be called and described thus:

Alinement curve. The line passing through the center of the teeth mesio-distally.

Labial curve. From distal surface of cuspid to distal surface of cuspid.

Buccal curve. From cuspid to distal surface of third molar.

Compensating curve. Occlusal surface of bicuspid and molars.

Die. [*St.*] A facsimile of the form of the mouth in cast metal from which a metal blank is stamped to fit the mouth.—*Com.* 1896.

Die-plate. A metal stamp or die used for forming the cusps on shell crowns.—*Com.* 1896.

Denture. [*St.*, *G.*] The teeth of an animal collectively.

Special: A single set of artificial teeth. Full denture, a double set of artificial teeth, one for each jaw.—*Com.* 1895.

Dowel. [*St.*] Special: A pin or peg (usually of metal) used for joining an artificial crown to the root of a natural tooth.—*Com.* 1896.

Draw-plate. [*St.*] A perforated steel plate with holes of a gradually diminishing size, used to reduce the size of wire and metal tubing.

Dummy. [*St.*] An object made to represent something else externally or superficially.

Special: A tooth in a bridge to supply a missing natural tooth.—*W.* See *Substitute*.

Ferrule. [*St.*, *G.*] A metallic ring or cap applied to the end of the root or crown of a natural tooth to strengthen it.—*Com.* 1896.

A metallic ring or hoop slipping firmly over a natural tooth as a support for a partial denture.—*W.*

Flame. Gaseous matter heated to a state of luminosity.

Flame is—Yellow (carbon heated to in-

candescence) or blue (usually the carbon oxidation is complete, or no carbon is present).

Flame may be—Brush, broad-sheet, or pointed, round-tapering; oxidizing (the end of the flame); deoxidizing or reducing (just in advance of the hollow portion of the flame).

Flask. [*St.*, *G.*] Special: A metal (iron, brass or bronze) rim or box of special design, used to hold the mold for dies, cast and vulcanite work.—*W.*

Flasking. Special: In cast-metal dentures the cast and model plate are incased in a flask with a suitable incasing compound; in vulcanite and celluloid work the cast and model plate are incased in a flask, usually with plaster of Paris; this is called flasking. Solder work incased in a protecting substance without a flask is said to be invested. (See *Invest.*)

Flexible vulcanite. Vulcanite which is soft and extremely pliable after vulcanization, containing less sulfur than hard vulcanite.—*Com.* 1896. The committee preferred "flexible vulcanite" to "velum rubber."

As all hard vulcanite is somewhat flexible, "flexible vulcanite" does not convey a definite idea, therefore is not well named. As "velum rubber" is a definite preparation containing about one-third the amount of sulfur entering into hard vulcanite, and as it is the only variety of soft pliable vulcanite used in dentistry, it seems to the writer that it is preferable to use the term "velum rubber" before the material is subjected to the vulcanizing heat, and "velum vulcanite" after being acted upon by heat.

Flux. [*St.*, *G.*] A material such as borax or alkali, that will dissolve metallic oxides and promote the fusion of metals.

Fusible alloy. Any alloy, but usually one containing bismuth and melting at a very low temperature.

Gage (1), *gauge* (2). An instrument for measuring or indicating capacity, quantity, dimensions, etc.

St. and *Cent.* both give *gage* as first choice.

Gum-teeth. Artificial teeth with a porcelain gum extending above the crown. (Preferred by *Com.* 1896.)

"Section teeth" are block teeth.

Hard solder. [*St.*] Any solder that melts at or above a red heat.

Impression. [*St.*, *G.*] Special: An imprint of the edentulous ridges and palate or teeth in some suitable material, such as beeswax, modeling compound, or plaster of Paris.—*Com.* 1896.

A negative likeness of an object or part taken in a plastic material from which a cast or positive likeness may be produced.—*W.*

Impression tray or *cup*. [St.] A dentist's tray or cup used for holding the impression material while taking an impression of the mouth or teeth.—*Com. 1896.*

Cup conveys the idea of symmetry of form with a base on which to stand, and holding capacity; while *tray* conveys the idea of indefinite form, a utensil having flanges and a capacity to hold and carry. *Tray* is the better term.—*W.*

Ingot. [St.] A mass of molten metal cast in a mold.

Ingot-mold. [St., G.] A flask in which molten metal is cast into blocks or ingots.

Invest. [St., G.] To put a covering upon.

Investing. [St., G.] Participle of *invest*.

Investment. [St.] The material used for covering.

Special: Used in connection with solder work. Where the incasement is in a metal flask (as in vulcanite and cast work) use "flask" or "flasked." (See *Flask*.)

Iridium. [St.] Metal of the platinum group. The hardest metal known.

Iridio-platinum, **Platinum-iridium**. Alloy of the two metals, usually about 10 per cent. iridium to 90 per cent. platinum.

Joint. [St.] The place, point, line, or surface where two or more things are joined together. Joints are either "lap" or "butt." (See *Crown*—sectional.)

Labial. [St., G.] Pertaining to, or toward the lips.—*Black.*

Special: Outer surface of either upper or lower artificial denture, extending from the distal surface of one cuspid to the distal surface of the opposite one.—*W.*

Line. [St.] Any slender mark or band.

Median line. [St.] An imaginary line on the surface of the body between opposite symmetrical halves. (The middle line dividing the teeth.—*Black.*)

Lip line. The line defined by the lips closed and at rest.

High lip line. The line defined by the upper lip when elevated to the extreme by muscular action.

Low lip line. The line defined by the lower lip when depressed to the extreme by muscular action.

Lingual. [St., G.] Situated near or toward the tongue.

Special: The entire surface of either the upper or lower artificial denture next to the tongue.—*W.*

The term *palatine surface* should not be used.—*W.* (See *Maxillary*.)

Long bite teeth. Artificial teeth with the pins considerably removed from the incisal surface, permitting a considerable overlap of the opposing teeth.—*Com. 1896.*

Lower. [St.] Situated below a recognized level. Applied in dentistry to the lower jaw, teeth, lip, artificial denture, etc. Not "inferior."

Maxillary. [St., G.] Pertaining to the maxillæ or jaws.

Special: *Maxillary surface*. The surface of a tray, impression, or artificial denture that rests upon the maxillæ, either upper or lower.—*Weiss.*

Mechanical. [St., G.] Of or pertaining to mechanics on the physical side.

Mechanical dentist. A dentist confining himself to laboratory work. Not an operator, prosthetist, or orthodontist.—*W.*

Mold (preferred to *mould*). (Verb, the act of forming a matrix for a casting.) The form or matrix for shaping anything in a fluid or plastic condition.

Model. [St., G.] (Lat. *modus*, measure.) An object representing accurately something to be made or already existing. A material pattern of natural, heroic, or diminutive size. Sculpture: The plaster or clay original of a work to be executed in stone or metal; a person who does duty as a copy or pattern for painters or sculptors. A sculptor may idealize his living model; but his workman must exactly copy the model he has made in clay.

Special: In dentistry a plaster model is used to make a metal casting or die.

Wax models, which are to be reproduced, or the outlines retained in the complete work. Models are extensively used in technic work. Plaster models are never used in vulcanite work. "Model" is often improperly used for *cast* (which see).

Modeling compound. A material for taking impressions, consisting of a gum (as dammar, cowdie, or copal), stearin, and French chalk.

Moldine. A compound of potter's clay and glycerin used for taking impressions.—*Gorgas.*

Noble metal. [St.] A metal which does not unite with oxygen when exposed to the air or a red heat. (See *Base metal*.)

Obturator. [G.] That which closes a cavity. Dental obturator, an instrument made of metal or hard vulcanite, for an opening in the roof of the mouth. (See *Velum*.)

Occlude. To strike against, or close; as the

upper and lower teeth in a hinge-joint articulator.—*Black*. (See *Articulate*.)

Oxidizing flame. (See *Flame*.)

Periphery. [St., G.] Special: The outer edge of the base-plate of an artificial denture.—*W*.

Pier. [St.] From Gk. *petra*, a rock. It conveys the idea of a built-up mass as a support.

Preference given to *Abutment*.

Plain teeth. Artificial teeth without porcelain gum extension.

Plaster of Paris. [St., G.] Calcined gypsum. Used in making impressions, casts, models, etc.

Plate. A flat, extended, rigid body, as of metal.

Special: The base upon which artificial teeth are mounted.

Plate-teeth. Artificial teeth with headless pins, designed for metal backing and soldering.

Platinized gold. Gold plate covered on one or both sides with platinum.—*Com*. 1896.

Platinous gold. Gold containing a small percentage of platinum, often called "clasp gold."—*Com*. 1896.

Platinous silver. Silver containing a small amount of platinum. In England known as "dental alloy."

Porcelain. [St., G.] (*Porce'-lain*.) Pottery is divided into three classes—earthenware, stoneware, and porcelain. Porcelain is subdivided into three classes—hard, natural soft, and artificial soft. Dental porcelain belongs to the subdivision "hard porcelain." Hard porcelain is kaolin and quartz with a feldspathic glaze.

Dental porcelain may be defined as: A solidified suspension of one or more unfused silicious substances in a fused silicate.—*W*. Porcelain is high- or low-fusing dependent upon the quality and quantity of the basic (alkali) ingredient. Any porcelain becomes glass when there is a fusion of all of its necessary constituents.

Post. [St.] An upright piece of timber, metal, or other material, used as a support. Used synonymously with "dowel," but dowel is the preferred term. (See *Dowel*.)

Prosthesis. [St., G.] (*Pros'-thes-is*, St. and G.; *pros'-the-sis*, *Com*. 1895. From Gk. *pro* or *pros*, and *tithemi*, to place.) The replacing with an artificial substitute a lost part or organ.

Special: The science, art, and esthetics of restoring a lost dental organ or organs and associate parts with an artificial substitute.—*W*.

Prosthodontia. (From two Greek words meaning, "to replace teeth.")

While the word is perfectly formed, it is too restricted in its meaning and conveys a very erroneous and detrimental idea; therefore it should be banished from dental nomenclature.

Reducing flame. [St.] The inner portion of a blow-pipe flame that will reduce metallic oxides or metallic salts to a molten metal button. (See *Flame*.)

Relief. [St.] Special: A space created upon the maxillary surface of an artificial denture to keep it from resting unduly upon the hard tissues.

Removable. (See *Bridge*.)

Resorption. [St., G.] The taking up through the action of absorbent vessels, of tissue already formed.—*St*.

The alveolar process is resorbed, or removed by resorption. (See *Absorption*.)

Retention of artificial dentures. By—Adhesion by contact; atmospheric pressure; clasps; clamps; ferrules; spiral springs; spring plates.

Rubber. [St., G.] A name for unvulcanized caoutchouc.

Ruga and Raphe. [St., G.] *Ruga*, pl. *a*. The lateral folds or ridges in the anterior portion of the vault of the mouth.

Raphe. Applied to the ridge in the median line of the vault of the mouth.

Section or section teeth. [St.] Blocks of one or more teeth with pink gum attachment.

Shell crown. See *Crown*.

Short-bite teeth. Porcelain teeth with pins arranged near the incisal edge of the tooth, which arrangement allows only a short lap over the opposing teeth.

Soft solder. [St.] A solder which melts below a red heat, usually restricted to alloys of tin and lead.

Solder. [St.] A fusible alloy used for joining two metallic substances or surfaces.

Soldering block. [St.] A support for holding the work while soldering.

Soldering flame. [St.] Same as reducing flame.

Soldering iron. [St.] A tool with which soft solder is melted and applied.

Spence compound. A compound of plaster of Paris, Portland cement, and sand. Used for making hard casts for vulcanite, etc.

Splint, dental. Special: An appliance made of metal or vulcanite for supporting either a fractured maxilla or mandible.

Splint, interdental. Special: An appliance made of metal or vulcanite and placed between the jaws to support a fracture of either the maxilla or mandible, or both.

Straight-pin teeth. Artificial teeth with the pins arranged in a line parallel with the long axis of the tooth.—*Com.* 1896.

Substitute. [St., G.] That which takes the place or serves in lieu of another. A term preferred by Dr. W. Storer How to "dummy," in bridge work.

It is a much more expressive and desirable term, and should be adopted by the profession.—*W.*

Suction plate. [St.] (Lat. *sugo*, to suck.) The term is neither euphonious nor well applied. A better term would be *pressure plate*.—*W.*

Surface. The surfaces of an artificial denture are—Labial, buccal, lingual, and maxillary.—*W.*

Swage. [St.] Special: To shape between a die and counter-die.—*Com.* 1895.

Sweat. [St.] To send forth, exude, or perspire. "Sweating" used synonymously with "autogenous." Not euphonious, but best describes the process.—*W.*

Teeth, artificial. Forms or kinds of artificial teeth:

Tube. A tooth having a thin platinum tube occupying the center of its long axis.

Pinless. Having holes and grooves in which vulcanite is attached.

Plate. Having long pins and flat back for solder work.

Facing. Same as *plate*, only thinner.

Saddle-back. Having a concave cervicolingual portion.

Gum. Having a gum-colored portion attached.

Plain. Without gum portion.

Cross-pin. Having pins at right angles to the long axis of the tooth.

Straight-pin. Having pins parallel with the long axis of the tooth.

Slot-and-bar. A removable tooth with a slot in it to slip over a bar.

Bar-and-slot. Having a bar attached to the tooth to slip into a slotted backing.

Short-bite. Having the shoulder and pins near the incisive edge.

Long-bite. Having the shoulder and pins near the middle of the tooth.

Vulcanite. Having short, headed pins.

Vacuum chamber. A space entirely devoid of matter; applied to the depression in a denture calculated to assist in retaining it in place.

Velum rubber. Rubber with about one-fifth of its weight of sulfur. Suitable for making artificial palates. Remains pliable after vulcanization.

Velum vulcanite. Velum rubber after vulcanization.

Vulcanite flask. A sectional metal box for holding an artificial denture while being vulcanized.

Vulcanite. [St., G.] Rubber or caoutchouc that has been compounded with sulfur and subjected to heat.

Vulcanization. [St.] The method of converting rubber into vulcanite.

Wax. [St., G.] Wax is extensively used in the dental laboratory. Pure beeswax, for impressions and articulating models. Wax and paraffin, or earthwax, for trial base-plates, articulating models, etc.

Hard wax, for securely cementing parts in crown and bridge work.

Adhesive wax, which is less brittle and more adhesive than hard wax, is sometimes desired.

Dr. Goslee, "Principles and Practice of Crowning Teeth," gives the following formulæ:

Hard wax. Resin 2 to 4 parts, wax 1 part. **Adhesive wax.** White beeswax 8 oz., pulverized white resin 1½ oz., gum dammar 1½ oz. Melt materials in the order named.

Weld. [St.] To unite or consolidate; as weld to gold in filling. Used synonymously with "autogenous soldering" and "sweating." It should not be so used, as force is the first requisite in welding, and force is not used in autogenous soldering or sweating.

Zylonite. [St., G.] (Same as *Celluloid*.)

A VACANCY IN DENTAL JOURNALISM.

By WILLIAM H. TRUEMAN, D.D.S., Philadelphia, Pa.

(Read before Section I of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

NOTWITHSTANDING that there are many dental journals in the United States, and that their objects and aims cover a wide field, there remains a vacancy. The scientifically inclined are provided with stately journals that fully meet their needs, while readers who desire to be amused find others wherein science, practical suggestions, and jokes—good, bad, and indifferent—are freely commingled. Betwixt and between these extremes we find well-conducted dental journals devoted to special branches of the science; others that appeal, in a measure at least, to the laity, and are intended as much for the waiting-room as for the office. The colleges have their journals, published in the interests of their students. Not one, so far as the writer knows, on this side of the sea, has been especially devoted to the up-building of the dental profession as an organized body. This is the vacancy to which I ask your attention.

That the vacancy exists in this year of grace 1906 indicates an oversight on the part of the profession's leaders.

Organization makes the vast difference in effectiveness between a mob and an army. The dental profession in the United States is a mob. It lacks the inspiration, the discipline, and the unity conferred by a thorough and effective organization. Its many associations interest but a moiety of the profession. They are independent units, each going its own way with but little regard or concern for its fellows. It has no controlling or directing head. It has no mouthpiece. It has no systematic means or methods for reaching its scattered members, or those who newly enter its ranks, to interest them in matters concerning the profes-

sion at large. This aimlessness, this want of organization, subjects its active members to a needless and wasteful duplication of effort in some cases, and leads to working at cross purposes in others. Notwithstanding the many dental journals published in the United States, there is not one to which a practitioner can look for information regarding the profession in his own state, its numbers, its associations, its prospects, or its needs; not one concerned in giving him information on these points regarding the profession at large, its educational institutions, or the legal requirements of the several states. How many can answer offhand. How many dental societies are there in your own state? How many dental practitioners? How many of these are members of a local or of a state society? Where, indeed, let me ask, can this information be obtained? or, when obtained, how can it be made generally known to your fellows? The writer knows of but one publication in the United States that pretends to give information of this kind, or from which it can be gleaned. This is a commercial enterprise, and so expensive that but few can afford a copy.

The result of this is that but few dental practitioners have any knowledge of, or interest in professional societies, and even the members of the societies, as a rule, are satisfied to be interested only in local affairs. Dental practitioners may know, in a perfunctory sort of a way, that there is in their state a state dental society, and that somewhere there is a National Dental Association. Society members may be reminded of their existence once a year, it may be, when the local society goes through the form of electing delegates to these important as-

sociations, or once in the twelve months when they receive a program of the coming meeting. What are their functions, wherein do they differ from the local society, or what are the relations of the local, the state, and the National Association, the one to the other?—who can answer?

A dental practitioner, unless a member of these distant societies or happening to be a subscriber to the journal in which their proceedings are published, may wind up a long and active life in blissful ignorance of their existence. What is to hinder? They make no effort to reach him, nor to interest him in their affairs.

No one will contend, I am persuaded, that this is a desirable state of affairs.

At this time there seems to be an awakening to the evil associated with this, and a desire and an effort to correct it. The question of interchange of state license is bringing to the fore the want of unity between the states regarding professional requirements, and is leading, slowly yet surely, to a universally recognized standard. Some of the state societies, by a vigorous effort, have greatly increased their membership, and their example will no doubt stimulate others to do likewise. There is dissatisfaction with, and a satisfaction within, the National Association and its branches; there is a general feeling that it is not measuring up to its possibilities—and this promises a betterment in the near future. These all are healthy signs.

The dental societies need some means to enable their members to keep in step, to work together, to systematize their efforts and conserve their strength. Furthermore, they need some more effective means than now possessed to reach, bring under their influence, and secure the co-operation of a larger number of dental practitioners. To assist in this the writer suggests the publication by the state societies at frequent and stated intervals, of a journal especially devoted to the interests of the profession in the state—a journal especially designed to bring about a closer fellowship between the state and the local societies. This should give the name, location, executive

officers, the program of each meeting, and now and again the membership list of each local society in the state. In addition to this, such items of information as will tend to keep the state society's progress and needs before the dental practitioners. This might be made sufficiently inexpensive for each issue to be sent regularly to every dental practitioner in the state, and to all others requesting it and willing to pay its cost and postage. This would prove but a slight tax upon the finances of a large state society, while the smaller state societies by uniting could do the same in their bailiwick without embarrassment.

By a similar inexpensive journal, freely distributed to the members of its affiliating societies, the National Dental Association could keep in close touch with the state societies, and through them with the profession at large. The journal of the National Dental Association, in addition to bringing prominently before the profession the state societies, the number of their members, synopses of their proceedings so far as they might be of more than local interest, would of course give prominence to its own affairs. It would invite attention to its own *ad interim* work. The needs of its sections and committees, and the progress made by them, might be helpfully presented from time to time. Its financial statements, laid before the profession in advance of its meetings, would invite confidence and would be suggestive. Changes in the dental laws of the various states, judicial decisions bearing upon them, the more important doings of the National Association of Dental Faculties, of the National Association of Dental Examiners, and of the state examining boards, being matters of general interest, would naturally find a place on its pages, not only in order to give them a wide circulation, but to place them on record where they could readily be found. By confining itself to the business affairs of general interest to the profession; presenting promptly and in a compact and convenient form for preservation and ready reference matters of vital importance

not now published—or if published at all, in so scattered a form among many journals as to render them practically inaccessible—such a journal would have a useful field entirely its own, and would assist materially in building up the business end of professional organizations.

Such a journal need not contain a stated number of pages, but may be contracted or expanded in accordance with the volume of matter in hand. The expense of its publication and distribution can well be met by the National Dental Association without embarrassment. If need be, the addition of advertising pages would offset to some extent its financial burden. It cannot expect, at first at least, any revenue from subscriptions, although the state societies might extend a helping hand. For several years the advisability of the National Dental Association having a journal of its own and publishing its own proceedings has been discussed. The attempt by the association to publish a dental journal in competition with those now in existence is not a promising venture. The association has no experience, is not strong in membership, has no capital, has but little prospect of sufficient financial backing; it cannot command the facilities nor the same careful economic business management as can a well-established, prosperous business house. The

dental profession seems well satisfied with its present professional journals. They have served, and do now well serve as exponents of professional progress in science, in art, and in usefulness. In many of them there is much to commend and but little to object to; they are well managed and keep well to the fore. They are supplied at a cost so close to that of their manufacture that competition in subscription price is out of the question. They are satisfactory to their subscribers, to their contributors, and to a majority of the profession. Until the profession is educated to appreciate sentiment above dollars, yards, and pounds, the dental journals as now published will easily hold their own. The time may come when this may be changed; it is not yet in sight. Until then it is best to avoid an experiment in which failure would not only entail a serious financial loss, but would furthermore prove a disaster by discouraging another effort.

By at first, as it were, "feeling one's way," and at a moderate cost entering a new field—one entirely devoid of competition—with the intention of advancing along lines suggested by experience when increased resources make an advance prudent, there will be less risk of failure; and failure, should it come, will be less conspicuous and less disastrous.

CONTOUR AND OCCLUSION OBTAINED WITH CAST FILLINGS WITHOUT WAXING OR INVESTING.

By A. M. JACKSON, D.D.S., Macon, Ga.

(Clinic presented at the meeting of the National Dental Association, Atlanta, Ga.,
September 18, 1906.)

AFTER securing a good matrix, thicken it with 22-k. gold solder. Then cut a strip of 22-k. or 24-k. gold plate one-sixteenth of an inch wide, and tack the end of the cervical margin

of the matrix by re-flowing the solder. Place the matrix in position on the tooth, and with pliers bend the strip of gold to conform to the outline of the area with which the filling should come in contact.

Burnish the margins of the matrix and remove it from the tooth. The result thus obtained is shown in Fig. 1.

as the soldering was completed, to show how the solder will cling to the outline strip.

FIG. 1.



FIG. 2.

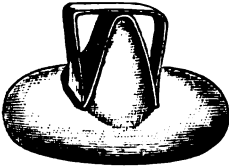
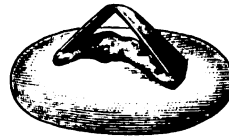


FIG. 3.



FIG. 4.



To protect the matrix and to facilitate handling, a bit of investment material is used, as shown in Fig. 2.

The next step is the flowing of the 20-k. solder between the matrix and the outline band until the desired result is obtained, as shown in Fig. 3. One side of the inlay shown at Fig. 3 has been polished, but the other side is shown just

Fig. 4 shows a single contour with the strip in position ready for the soldering. This little strip of gold may be used to contour or raise the cusps of bicuspid or molars by means of cast fillings. A piece of iron wire, secured into the investment material at one end, is of great value as a means of handling during the final soldering.

MANUAL TRAINING AN ESSENTIAL TO DENTAL EDUCATION.

By BURTON LEE THORPE, M.D., D.D.S., St. Louis, Missouri.

(Read before Section II of the National Dental Association, Atlanta, Ga., September 18, 1906.)

IN contending that manual training is a prerequisite to dental education the writer would not discredit or underestimate the skill of the many men who in the past with their mechanical and artistic talent have ornamented dentistry. In reviewing the careers of our foremost practitioners who have made reputations for themselves, it is a notable fact that

the majority, before they became famous as dentists, had enjoyed the benefits of manual training in some form or other, and this doubtless developed the skill which they later exhibited in dentistry.

As many of them were mechanics, who would gainsay that the preliminary training obtained in the occupations of blacksmith, barber, traveling tinker—all hon-

orable vocations—did not make it possible for our professional forefathers to accomplish what they did. For instance, Hayden, whom we may safely denominate the “father of dental science,” was a carpenter and architect; Eleazer Parmly was a printer by trade; W. H. Atkinson and W. W. Allport were both tailors’ apprentices; Elisha Townsend was a watchmaker in his early youth; John Greenwood, a maker of nautical and mathematical instruments; Amos Westcott, an inventor of agricultural implements; Edward Maynard, a blacksmith, civil engineer, and architect, and later one of the world’s greatest inventors; S. P. Hullihen, a silversmith by trade; Marshall H. Webb and W. G. A. Bonwill, inventive prodigies; John J. R. Patrick and N. C. Keep, jewelers and diamond-setters; Elisha Neall, a traveling tinker and clock and watch repairer, while many others followed similar vocations, or obtained a crude manual training in early youth on the farm, which is one of the best schools to give the man self-reliance and manipulative dexterity; for it is a fact that when a man is able to *do things*, both mechanical and artistic, he possesses a degree of self-reliance, self-mastery, judgment, and poise of character obtainable by no other means. Having acquired these qualities, he will have an appreciation for the dignity of labor, and will be able to concentrate his thoughts upon things both mental and material.

Probably the best fruit of manual training is the acquiring of the habit of mechanical analysis, which can be learned only by actual work with tools and materials. In ancient times, “Schools were for the study and mastery of books. The arts of the schoolroom were for masters and freemen, hence they were noble and were called liberal arts. The arts of the mechanics were for serving-men, and were acquired only by intimate association with mechanics; so the practical arts were held to be degrading because of requiring a base companionship.” Criticisms and objections to educational manual training have appeared with less frequency in later years, and the object and value of such training is rapidly be-

ing recognized throughout the civilized world. Men of all ages have recognized the value of skill gained in the use of tools. Time will not permit of our going into an historical *résumé* of manual training, although it is of interest to note that Vulcan, Archimedes, J. J. Rousseau, Peter the Great, our own Emerson, and many others advocated systematic instruction and practice in the details of an occupation. In days past it was taken for granted that the avenue by which mechanical skill could be acquired lay only through apprenticeship. The progress made in educational matters in the past is nowhere more marked than in the teaching of the mechanic arts. Twenty-six years ago the first manual training school in the world—with a course of study “designed to combine manual with mental training; to put the liberal arts and the mechanic arts side by side; to deal simultaneously with material forces and appliances and spiritual forces and appliances; to cultivate the judgment and executive faculties as well as the memory and the understanding; to extend the humanities so as to include human life, human activities, and human needs as they exist now”—was founded in the city of St. Louis, as a department of Washington University, by Prof. C. M. Woodward, who from that time to the present has been at the head of the institution as its director. In this institution, thoroughly equipped with all appliances and apparatus, the student is taught the fundamental principles of mechanics, mathematics, physics, chemistry, metallurgy, electricity, etc. The course of instruction embraces six parallel lines, as follows:

First: A course of mathematics, including algebra, plane and solid geometry, plane trigonometry, and higher algebra.

Second: A course of science, including zoölogy, botany, chemistry, and physics.

Third: An extended course of English language and literature, including grammar, rhetoric, composition, and history.

Fourth: A course in history or a

foreign language, governed by the usual restrictions concerning electives in secondary schools.

Fifth: A course in drawing—free-hand, mechanical, and architectural.

Sixth: A course of tool instruction, including joinery, wood-carving, wood-turning, molding, pattern-making, soldering, forging, and bench and machine work in metals.

When a student has completed this course his hand and brain are both trained to produce exact and artistic results. The element of manual labor enters into the life-work of the dentist more than into any other calling. The underlying fundamentals are mechanics combined with art. The writer has been a close observer of the results of manual training, and has noted that the students who have taken this course prior to studying dentistry make very superior dentists—far surpassing the untutored fellow student in technic work. Personal experience, as in manual training, is the only effective way to train and develop the brain cells which control the movements of the hand, and the value of this method of preliminary education to those who would take up the study of dentistry cannot be overestimated.

It may be contended that the dental student has sufficient manual training in the laboratory courses in our schools. Preliminary educational manual training is not training the hand to turn out

finished products, as in the laboratory, but the training of the brain through the faculties of perception, with elemental studies of beauty, harmony, precision, and accuracy; and although this of course, may result in some finished product, still it is not the hand-produced article, but the impression made upon the mind, that is to be valued. If the student be slow of comprehension, dull, uninterested in the principle of mechanics, unable to see beauty in perfectly executed operations upon wood or other materials, and after careful training is not properly impressed with the value of "accuracy of angle and precision of surface," how can he hope to succeed in the practice of dentistry, which is largely a continuation of these precepts requiring much care and skill in their execution!

The writer fully believes that if a course in manual training were a preliminary requirement to the dental college curriculum, the same as an academic preparatory course is a requirement for entrance to any of our great universities, all dentists of the future would be so thoroughly equipped in technical skill that each would be competent to practice dentistry with a creativeness that would greatly enhance the worth and standing of dentistry.

Dr. Hungerford has aptly said that "Science may quarry the marble, but it is the mechanic, the artisan, that chisels it unto the likeness of a god."

CORRESPONDENCE.

SALOL IN TOOTH-POWDERS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the issue of the DENTAL COSMOS for November 1906, page 1165, appears the formula of a tooth-powder which I recommended ten years ago, and which was published at about that time in the chapter on pyorrhea alveolaris of the treatise on "Applied Therapeutics" by Dr. Albert Robin.

A year after prescribing that formula, I observed several cases of eczema of the

lips which I soon traced to the salol in the powder—inasmuch as its elimination from the formula was followed by a disappearance of the eczema. Therefore salol should never be used as an ingredient of tooth-powders, and personally I have discarded it ever since.

Yours truly,

A. C. HUGENSCHMIDT, M.D., D.D.S.
PARIS, FRANCE, March 1907.

PROCEEDINGS OF SOCIETIES.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

Summary of the Proceedings at the Meeting held at Geneva, Switzerland, August 8 and 9, 1906,

AS

Reported by the British Delegates to the Representative Board of the British Dental Association.

TO THE REPRESENTATIVE BOARD, B. D. A.:

We have the honor to submit the following brief report of the proceedings of the meeting of the F. D. I., held at Geneva, Switzerland, August 8 and 9, 1906.

Professor Miller of Berlin presided. Mr. J. Howard Mummery was one of the vice-presidents.

The municipal authorities of Geneva lent the Palais Eynard for the purposes of the meeting, and the city and the state both lent their patronage and support to the Federation.

At the meeting of the Executive Council on the first day, Dr. E. C. Kirk, secretary, presented his annual report. The Council, in pursuance of its policy of non-intervention in strictly national professional affairs, declined the request of the Association of Dental Faculties of the United States to nominate some of its members to a board of regents which should be charged with the consideration of matters concerning professional education in America.

The Odontological Society of Uruguay was admitted to the F. D. I.

An invitation was received from the Dental Convention to be held at Jamestown, Norfolk, Va., in September 1907.

The Treasurer's report and balance-sheet were received and adopted.

A general discussion took place regarding the most profitable sphere of activity for the F. D. I. in the immediate future. In this discussion Messrs. Sauvez, Miller, Paterson, Godon, Grevers, Aguilar, Guye, and Campion took part. As it appeared that there was a demand for a formulated ideal scheme of dental education bearing the imprimatur of the F. D. I., it was remitted to the Commission of Education to draw up such a scheme.

On motion of the British representatives, paragraph 2 of Resolution No. 2, adopted at Hanover, was altered to read—

The reports of the different commissions shall be submitted to the Executive Council. No report shall be regarded as official until it has been adopted by the Executive Council.

The International Commission of Dental Terminology was constituted. For Great Britain the following were nominated: A. Hopewell-Smith, W. Guy, W. B. Paterson, and J. F. Colyer. J. Grevers was appointed chairman of this commission.

To the International Commission of Dental Legislation, G. Cunningham, J. Gaddes, and W. H. Dolamore were nominated.

The principal work, which could never have been carried through unless all concerned had been animated by the greatest enthusiasm and ardor, coupled with a sincere desire for unanimity and mutual accommodation, was the preparation of the reports of the various commissions. It is gratifying to be able to add that in every case the report of a commission, though arrived at only after long debate and earnest discussion, was unanimously adopted by the Executive Council.

These reports follow:

Commission of Dental Hygiene.

Certain questions were submitted to this commission, which formulated these resolutions in response:

(1) It is of the greatest importance for the comfort and health of children, and for the improvement of the standard of physique and beauty, that teachers and scholars in primary schools should receive instruction in the best means of preserving the teeth.

(2) It is of the greatest importance that the teeth of all children, and especially of those between the ages of five and nine years, should be carefully inspected by dental surgeons, and that treatment for the prevention and cure of dental caries should be begun as early in life as possible.

(3) It is of the highest importance that the teeth of children of the poorer classes should be examined and treated by qualified dental surgeons, who should be appointed and paid by the municipality or the state.

(4) The F. D. I. considers that it is part of its duty to bring home to the public the importance of the dentist's professional work.

(5) In addition to public instruction by pamphlet, the F. D. I. considers that this may be best attained by teaching the school children, and providing for them a dental clinic at which they may receive what attention they require. The F. D. I. exhorts the national committees to approach their dental organizations with a view to action in the matter of obtaining municipal or state-aided dental service for the children.

(6) The general meeting of the F. D. I. held at Geneva, August 9, 1906, invites the president of the Executive Council to institute a commission, composed of himself and two other members, charged to prepare a pamphlet instructing the public in the principles of Dental Hygiene, and to this end to procure and consult pamphlets of a like nature which may have already been pub-

lished. The pamphlet to be submitted to the 1907 meeting of the F. D. I.

Mr. F. J. Turnbull of Edinburgh acted as secretary to this commission, his report on what had been done in the matter of Dental Hygiene in Great Britain being very cordially received.

Commission of the International Dental Press.

The Executive Council sanctioned the publication of an *International Dental Bulletin*, primarily devoted to the proceedings of the F. D. I., to be edited by M. Paul Guye, and published in four languages—French, German, Spanish, and English. A subsidy of £40 was voted to the *Bulletin*.

Commission of Dental Legislation.

This commission presented no report, but as a result of its deliberations appointed three subcommittees to consider and report on three separate remits.

Commission to Define a "National Committee" of the F. D. I.

This commission, consisting of Messrs. Harlan, Sauvez, and Guy, presented the following report, which was adopted:

(A)

[See Art. X.]

(B)

I. A National Committee is composed of the representatives to the Executive Council appointed by the permanently organized and duly recognized national dental association of any country affiliated to the F. D. I.

II. Casual vacancies on a national committee shall be filled by its national dental association.

III. The national committee of any country shall be elected by the national dental association of such country, and the election ratified at the annual meeting of the F. D. I.

IV. Appointments to commissions of the F. D. I. of members from any country must be submitted to and assented to by the national committee of such country.

V. Power to take action in any country on any resolution or recommendation of the F. D. I. shall reside solely with the national dental association of that country, which may, however, delegate such power to its national committee.

VI. The F. D. I. Executive Council shall determine the number of representatives to represent a national dental association and constitute the national committee.

VII. In countries where there is no single national dental association, the national committee shall be composed of the representatives of one or more permanently organized dental associations affiliated to the F. D. I. and duly authorized by the F. D. I. to elect representatives.

Commission of Education.

Extraordinary interest was manifested by the members of this commission, and a great discussion took place. Eventually the commission appointed a subcommittee, consisting of Messrs. Brophy, Roy, and Guy, to formulate the report of the commission in a series of resolutions.

The following report, drafted by this subcommittee, became the finding of the commission, and was adopted by the Executive Council:

(1)

RESOLVED, That in the opinion of the F. D. I. measures should be taken to impress on those charged with the general preliminary education of youth the necessity of manual training as the complement of intellectual training, and that this opinion applies with special force to the case of those who are destined to practice surgery or dental surgery.

(2)

RESOLVED, That a committee of five members—namely, Messrs. Brophy (the chairman), Godon, Roy, Guy, and Kirk, with power to add to their number—be appointed to consider formally and submit to the next annual meeting of the Executive Council of the F. D. I. a schedule showing, first, the minimum, secondly, the ideal curriculum of dental instruction, in accordance with the resolutions of previous sessions, to serve as bases on which schools in different countries might build up their qualifying curricula.

(3)

RESOLVED, That in the opinion of the F. D. I. the armies and navies of the world should receive into their services as dental surgeons only men who have completed the prescribed courses in a recognized dental school and have been duly qualified in the country of their service as dental practitioners.

(4)

RESOLVED, That in the opinion of the F. D. I. dental colleges should show in their

time-tables the actual duration in days and hours of their classes and courses of instruction.

(5)

RESOLVED, That a committee, composed of Messrs. Guy, Kirk, and Roy, should be appointed to draw up for the next meeting a report on the means of establishing an International Advisory Board, to study the qualifications and the value of the diplomas in the schools of different countries.

A resolution was also proposed by Dr. Chiavaro to the following effect:

(6)

Inasmuch as the curriculum of dental schools does not impart the instruction, either theoretical or practical, which is indispensable for those designing to engage in the practice of dentistry,

RESOLVED, That in the opinion of the members of the F. D. I. the said curriculum for such persons should be so amended as to provide for instruction extending over a period of two calendar years of not less than 1200 hours each in the special branches of dentistry, and that such instruction should terminate in a legal dental qualification only after a rigid examination in all the branches taught.

There was a French text of this resolution, but it was ordered to be amended in accordance with the English resolution, and the resolution was adopted.

It was decided to hold the next meeting of the F. D. I. at Amsterdam at the beginning of August 1907.

In conclusion, we thank the association for the honor it has done us in electing us as its representatives. We record the great pleasure we have had in taking part in the work of the F. D. I., our conviction that much good will result from the meeting of men representing so many nations, and our hope that many of our members will join the F. D. I. and attend its meetings, thus admitting the existence of and undertaking the burden of international as well as national obligations.

We have the honor to be, etc.,

J. H. MUMMERY,
W. B. PATERSON,
W. HARRISON,
G. CAMPION,
W. GUY.

—*British Dental Journal.*

NATIONAL DENTAL ASSOCIATION.

Tenth Annual Meeting, Atlanta, Ga., September 18-21, 1906.

(Continued.)

SECTION I: Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

(Continued from page 386.)

Chairman—B. L. THORPE, St. Louis, Mo.

Secretary—D. O. M. LECRON, St. Louis, Mo.

THE next order of business was the reading of a paper by Dr. J. Q. BYRAM of Indianapolis, Ind., on "The Present Status of the Porcelain Inlay." Dr. Byram not being present, his paper was read by Dr. George E. Hunt of Indianapolis. [This paper is printed in full at page 433 of the present issue of the *Cosmos*.]

Discussion.

GEO. T. BANZET, Chicago, Ill. My first desire in opening the discussion of Dr. Byram's most excellent paper, is to compliment the essayist upon his noble creation.

However, those who know Dr. Byram, and know of the great amount of work which he has done, both in his practice and experimentally, conducting as he has over three thousand experiments on the fusibility of porcelain, would expect no less able an effort from such an enthusiastic and conscientious scientist. It is a genuine pleasure to discuss this paper, and to endeavor to bring out some points which the essayist has not particularly dwelt upon. I wish to emphatically approve of his position when he states that porcelain should take its place among the other filling materials and not be used exclusively. I have had sufficient experience with porcelain to know absolutely that it cannot be used in all cavities without a great and unwarranted waste of tooth-structure, and no one can practice dentistry conscientiously who confines

himself to porcelain alone as a reparative material.

It is unfortunately true that many are discouraged, some by observation of work which in the beginning was not perfect, and others because they had not perfected themselves before taking up this line of work. The latter condition is particularly deplorable, because it is extremely difficult to convince these individuals that they themselves, rather than the method, are at fault. Experimenting in this work must be done; no one can escape it. The question therefore arises, Shall the experiments be conducted on models outside of the mouth, and where your failures will bring no humiliation; or will you "try it on the dog," and thereby lose perhaps some of your best patients, and your past reputation for skill and progressiveness? Knowledge of the technique and properties of the various porcelains and metals to be employed as matrices, as well as manipulative skill, can be obtained by experimenting on models better than in any other way. It is true that failure of an inlay in contradistinction to that of a metallic filling can be easily determined. Recurrence of decay, which is very rare, can only occur at the margins, and here it is easily discovered and remedied. It is also true that many crowns are inserted when it could be obviated by the use of inlays.

Porcelain is the ideal filling material for all cavities which are not subjected

to masticatory stress, for the reasons which the essayist has advanced, namely, freedom from thermal and electrical action, esthetic appearance, and because of its highly glazed surface, which inhibits to a greater extent than any other material the retention of food débris. For all buccal, lingual, and compound cavities where the margins are not in danger of fracture, as well as for the anterior teeth, I would most heartily recommend it. Cavity preparation must be carefully studied, and for this the work on the models will be the most beneficial.

I wish to take issue with the essayist when he declares that "absolute angles both on the margins and in the cavity are to be avoided." The more nearly absolute are the angles in a cavity, while still permitting the withdrawal of the matrix without distortion, the less will be the liability to dislodgment, the more accurately will the inlay go to its place when set, and the greater the force which it will be possible to use to expel the excess cement. The margins should be almost at right angles to the adjacent tooth-surface, as this form will permit of the use of the great degree of force necessary in order to accurately burnish the matrix, and will obviate the formation of frail margins and friable inlay edges. The vast majority of inlay operators have a horror of getting folds of the matrix on the margin. This, however, is of absolutely no consequence.

Many talk at great length on cavity preparation, and then, in their anxiety to prevent folds on the margin, tear the matrix so badly that they cannot secure perfect adaptation to the walls of the cavity, thus defeating the object of their careful preparation. If the margins have been properly prepared at nearly right angles to the adjacent surfaces, the matrix can be perfectly adapted to the walls of the cavity, and then if folds occur on the margins they can be readily burnished down to the same thickness as the remainder of the matrix without the slightest danger of fracturing the margins; in addition to which the folds will very much stiffen the matrix. I almost invariably use platinum for the matrix, as I

prefer the high-fusing bodies. There is very little danger of distortion in carving or fusing if care be used. I find that a solution of shellac, painted just inside the margins at certain points, will to a great extent obviate distortion in fusing.

I cannot believe that there is greater loss of tooth-structure in preparation for inlays than for fillings. At times there is an apparent loss, but it is always in a position where it will not weaken the tooth. I have many times retained the labial enamel plates of the incisors and canines, reinforcing them with porcelain inlays, where they could not possibly have been safely retained in any other manner. It is essential to be able to carry the tooth-form in the mind, otherwise it will be necessary to place the unfinished inlay in the cavity after each fusing in order to be sure of the proper contour, as all grinding after the inlay is set should be avoided. Water should always be employed to mix the porcelain, and as little as possible, care being taken to absorb all that may remain in the matrix before fusing. This can most easily be accomplished by bringing the porcelain in the matrix into contact with the dry powdered porcelain which you are using, and then removing it with a brush. I have recently been using a foundation body which matches the tooth to be restored as nearly as possible, and then finishing the inlay with the enamel bodies. My usual practice is to employ Whites' bodies—the fusing-point of which is above that of Brewster's foundation bodies—for the foundation, and to finish the inlay with Brewster's enamel and finishing bodies, care being observed not to carry the porcelain to a full glaze except in the last fusing. I prefer hydraulic cement for setting the inlay, as thereby the saliva may be allowed to reach the inlay within two or three minutes, thus conducing much to the comfort of both patient and operator, with the consequent saving of time, as some other operation may be carried on while the cement is crystallizing.

In closing, I wish to indorse what the essayist has to say regarding porcelain art, for unquestionably it is an art to

be able to so restore decayed or broken teeth that the filling or inlay will not be perceptible; and it is only by thorough and conscientious work that one can acquire the knowledge sufficient to secure such results.

Dr. H. H. JOHNSON, Macon, Ga. The paper is a most valuable one, and I think it comes nearer to covering the subject completely than any paper on porcelain inlays I have ever listened to. It shows that the writer is a keen observer, and that he has had vast experience in this work. There are just one or two points on which I would like to speak; one is that he cuts the overlapping margins of the matrix entirely away. I have found that the matrix has greater rigidity and is easier to be kept in shape where the overlap is left quite broad, so that it can be handled with greater carelessness, so to speak, without danger of changing its shape during the process of introducing the porcelain into position.

The allusion to cementing the inlays into place without removing the matrix reminds me of my early experience in porcelain work. In 1893, or about that time, Dr. Downie introduced his little gas furnace, and I made some inlays with it at that time. I cemented these into place without removing the gold matrix, and I do not know whether this was not the reason for these imperfect fillings having lasted as long as they did. I placed several dozens of these fillings in the mouths of patients about that time, and of these I have had four under my observation until last year, when three were removed by Dr. Hinman—one of them being still good—and replaced with much nicer fillings. Of course I believe that at this time I can do more perfect work myself, because we have better materials; but these imperfect fillings did preserve these teeth for twelve years, although the work was imperfectly done, because both the furnace and the porcelain used at the time were imperfect. I simply allude to that because the essayist had something to say on that subject.

He also says that either high-, low-, or medium-fusing bodies will do, according to the preference of the operator. I dif-

fer with him in that respect very materially, as I think that the low-fusing bodies are exceedingly preferable—the lower the better. If I can find any porcelain that will fuse lower than the ones I am now using I will adopt it. I prefer such for the reason that delicate colors are very prone to be changed by heat, and are very easily bleached out. It becomes necessary often to bake an inlay three or four times, and in doing so, the color of the porcelain, especially of the high-fusing one, is continually bleached out. He says, further, that a low degree of heat continued for a long time will not alter the colors. There I differ with him again, for I am aware that a low degree of heat if continued beyond a reasonable length of time does change the color of the body. To succeed, at least in so far as color is concerned, I find that it is necessary to remove the inlay from the furnace just as quickly as possible after the fusing takes place; and I also find when using low-fusing bodies, that it is best to have the furnace heated to the required fusing-point, and when ready, to slip the inlay into the furnace and watch it until the fusing takes place, and then immediately remove it. In this way one is less liable to burn out the color of the porcelain. I have had much greater success since adopting this plan.

The art of making inlays, because it is an art, will probably never be successfully done by the average operator. It is now being used quite generally over the country, probably more generally than the essayist thinks, but there will only be a few, a very few, in the profession who will ever attain anything like perfection in this work. The reason for this is very plain, as a greater knowledge of art is required to mix colors accurately than is called for in any other branch of dentistry. The art of color-mixing also extends to the cement question. You may make a perfect inlay, place it in the tooth temporarily to try it, and probably you will hardly be able to discern it at all. Now mix the cement and place the inlay again in the tooth, and you will find that it is considerably off color. So that one not only has to contend with the color prob-

lem in mixing the porcelains, but also in mixing the cement.

Dr. F. E. ROACH, Chicago, Ill. I do not know that I have much to say on this very excellent and timely paper by Dr. Byram, for the reason that I cannot disagree with him on any point. What I do say will be to further emphasize the good points brought out by the essayist. Knowing him as I do, and the successful work he has done in porcelain, coupled with my own experience and observation, I am prepared to indorse all he has said.

I do not think that there is any question at this time as to the inlay being an established part of dental practice—the inlay in some form. We must accept it as a feature of our practice. While many of us may not adopt porcelain, I feel that there is a field for the inlay method of saving teeth in some of its phases—either the porcelain or some form of gold inlay. We hear occasionally that the popularity of the inlay is on the wane, and that it is soon to be laid on the shelf with other fads. I regret very much to hear Dr. Johnson throw out the discouraging remark that it is only for the few who are skilful—for the man who has the delicacy of touch or the ability to acquire this delicacy of manipulation—to use porcelain as a filling material. I most emphatically disagree with Dr. Johnson in that respect.

Dr. JOHNSON. I did not mean to say that the average operator would not be able to manipulate porcelain successfully so far as making a fit and preserving the teeth are concerned. What I said was in regard to the artistic and esthetic phases of the work, and if I failed to make that point clear it was through oversight.

Dr. ROACH. Dr. Johnson's remark that it requires unusual skill to make porcelain inlays is wrong. I believe that the average operator can acquire the skill to make a tooth-saving porcelain inlay as easily, if not more easily, than he can acquire the ability to insert a tooth-saving gold filling. Experience in teaching porcelain, both to the practitioner and to the student, justifies my belief that the

inlay technique is as easily mastered as that of gold fillings. We do not make perfect inlays every time; neither does the gold operator put in a perfect gold filling every time. And so I say it is wrong to discourage men who are taking up this work. Of course you will have failures, but that does not mean that you do not possess the needed ability. We have not hitherto had the teaching requisite upon the subject of inlay work. It is just in its beginning; we are learning how to make inlays; we are just getting at the first principles. How many will agree on the question of cavity preparation? Some ten years ago Dr. Black gave us a systematized method of cavity preparation for metallic fillings based on scientific principles. We are far from that for inlays, but we are getting together as we are going farther along the line, and eventually we will have a system of cavity preparation; and when we arrive at such a systematized plan there will be no occasion for the claim that men are not able to acquire sufficient skill for making inlays. I have been an enthusiast on this subject for several years and as time goes by I become still more enthusiastic.

I had the temerity two or three years ago, in a paper read before the Northern Indiana Dental Society, to predict that the inlay system would be the method of filling teeth in the future, and I am more strongly of that conviction today than ever. I have never said or believed that gold and amalgam will be laid aside, but I do believe that filling work, in the case of the large majority of cavities that come to us, will in the future be done by some form of inlay. I believe that the man who is not yet practicing the inlay method is doing himself and his patients a great injustice, and the sooner he adopts the inlay method in some of its forms the sooner he will save himself a great deal of hard work, and his patients a great deal of inconvenience; and he will accomplish, I believe, better results.

Now with regard to the fundamental principles of cavity preparation for inlay work. While the difference in cavity preparation for inlays and that for metal fillings is not wide, the principles are

practically the same. We must have free access to the cavity; we must have good solid walls, and if anything we go the gold operator one better in the practice of extension for prevention. For, as the paper says, in proportion as the size of the inlay is increased, its strength will be increased. And so we must learn the very first lesson, and that is cavity preparation. Free access from every angle, sharp margins, slightly diverging walls, and extension for prevention, if you please. Then we come to the rules of retention. The idea has prevailed, and still prevails, that we must depend upon the cement to hold the inlays in position. That I contend has led many men to failure and discouragement. They depend on the adhesion of the cement to retain inlays in shallow cavities. I maintain that all cavities must be so formed that the adhesion of cement will be supplemented by mechanical retention. My opinion is that ninety per cent. of the cavities prepared for inlays may be so shaped that frictional resistance will be the means of retention. Just what I term frictional resistance is this: Take for example the builder's lap in the placing of brick; one brick overlaps one-half of the adjoining brick, so that when the joint between each brick is luted with mortar a very powerful frictional resistance is offered against lateral displacement—that is the form of retention in a majority of inlays. In the case of cavities subjected to considerable strain we must resort to some more positive means of resistance, and that may be accomplished either by pins or by so shaping the cavity that some point or some surface of the tooth will act as a positive plane of resistance in the direction in which the inlay is most likely to be dislodged.

I would call your attention especially to one point brought out in the paper, and that is in regard to the fusing of porcelain. There is no question in my mind at all that Dr. Byram is absolutely correct in the statement that with too many inlay workers there is a tendency to fuse the porcelain too rapidly. The very best inlay will be obtained by

fusing the porcelain at a low heat for a long time. The great number of experiments I have made in my own experience thoroughly and absolutely corroborate this statement, and I want to emphasize this point. The practice I have frequently noticed, of placing a piece of porcelain in the furnace at the maximum heat and attempting to fuse it in a few seconds, is wrong. In that way the porcelain is broiled, and not baked.

There are five factors that enter into the scheme of matching the color of the tooth that one is operating upon, and these five factors are proper fusing, thickness of the layer of porcelain, the underlying colors, the modification of the colors by the cement, and the shadow problem. I find in my teaching of the selection and matching of colors that if I can get the student to bear in mind these five factors the results will be very much better.

There is much more that I might say on the paper, as it is one in which I am deeply interested, but I shall take no more of your time than simply to say that I want you to take it home and digest it—for anything that Dr. Byram writes you can well afford to study at your leisure moments.

Dr. H. L. AMBLER, Cleveland, Ohio. There has been quite a contrast drawn between porcelain inlays and gold fillings by the speaker who presented the porcelain subject, and I wish to contrast the two for just a moment. In 1864, before this association, the statement was made that no preparation of sponge or crystal gold would ever displace gold foil. I desire to make the statement here today that no preparation of porcelain for inlays will ever entirely displace gold foil. I have great respect for those who have developed the electric furnace, and who have spent much time in developing porcelain inlays. I admire the cosmetic effect of such inlays. I have a Custer furnace—the first one invented—and I sometimes make porcelain inlays. Dr. Roach has said that he believed porcelain inlays, in the majority of cases, would displace all other filling materials. It is my opinion, after forty

years in the profession of dentistry, that no young man within the sound of my voice will ever live long enough to see gold, gold and platinum in combination, tin, and amalgam entirely displaced. There are a great many men who can make a porcelain inlay. They can make a matrix fairly well; they can fuse the porcelain fairly well—I do not dispute that—one speaker said so, and I agree with him; but the great trouble with the majority of porcelain workers is that while they often make a fair inlay, when they set it in the cavity it is a failure. I believe we are making too many porcelain inlays today. I practice in Cleveland, which is a fairly large city, and I have seen there some inlays—inserted by operators in larger cities than Cleveland—that came right out of the teeth, and I know that some of these, although they had been made according to correct technique, had to be replaced by gold fillings. When you come to contrast the edge strength of the inlay with that of a gold filling, it is not to be mentioned in the same century. Especially is that true with incisal and occlusal fillings. I want to go on record, as I stated in the first place, as believing that the time will never come when our other good filling materials will be entirely displaced by porcelain. I do not wish you to think that I am decrying porcelain. It is all right in the right place, but it should not be placed in cavities improperly prepared to resist the mechanical forces brought against it.

Dr. ROACH. Dr. Ambler misunderstood me when I said I believed the inlay method would eventually supplant other methods of filling teeth. I did not say porcelain inlays entirely, and I would like to make that modification of my statement. I do not think that porcelain inlays will supplant other filling materials by any means, but I do believe that inlays—the inlay method—will be the most popular method of filling teeth in the future.

Dr. L. E. CUSTER, Dayton, Ohio. I would like to add a few points, one with regard to the idea of quick-fusing porcelain. There has been a demand for quick-fusing porcelain, and we have been

in the habit of trying to fuse it too quickly. That is all wrong, as pointed out in the paper, because during the time of fusing porcelain there is a chemical process going on, and it takes a certain length of time for this to take place, and thus give us a homogeneous mass when completed.

I do not think, as Dr. Ambler seemed to think, that the size of the city has much to do with the perfection of porcelain work. The most beautiful work of this kind I have ever seen had been made by a practitioner in a town of about twenty thousand people.

On motion Section I then adjourned to meet again at a later session.

SECOND DAY—THURSDAY.

The second meeting of Section I was called to order at 9 o'clock Thursday morning, September 20th, by the chairman, Dr. Burton Lee Thorpe.

The first order of business was the reading of a paper by Dr. V. H. JACKSON, New York city, on "Orthodontia: Opening the Bite in the Regulation of Teeth: a Metal Flange for Improving the Anchorage of Appliances, Moving Teeth, and for Harmonizing the Occlusion."

[This paper was printed in full at page 343 of the April issue of the Cosmos.]

Discussion.

Dr. J. W. PEETE, Memphis, Tenn. The paper just read by Dr. Jackson is exceedingly interesting to us as students of orthodontia, and I have few, if any, criticisms to make. He has shown himself a genius, as all who have read his book well know, in devising a great variety of fixtures for correcting the various forms of malocclusion.

Under the first division of the subject, "opening the bite in the regulation of the teeth," the essayist gives us a plan for making a good and efficient fixture. He says it is more commonly used for moving the incisors from lingual to labial position. In relation to these inlocked inci-

sors, it is in my opinion entirely unnecessary. Being a disciple of the Angle system I have always a positive and efficient means at hand that does not need a mechanical fixture to open the bite. There may be cases in which it would be an advantage to open the bite, but I agree with the essayist, they are very few.

Fig. 4 shows unilateral occlusion, entire lack of occlusion of the molars on the right side, lowers to lingual. In this case where there is entire lack of occlusion, and from this cause a condition of supra-occlusion has been induced, I think it would be well to open the bite, as otherwise a long time would be required to move these teeth.

Fig. 7 shows a plate for depressing lower incisors. Here again I must differ with Dr. Jackson. I do not wish to say that he cannot do the work that way, but I believe that there is a better way. I have not been able, thus far, to find a patient who was willing to bite persistently enough on an appliance to depress a tooth or teeth in the sockets. This is, I believe, the most difficult movement I have to make. Therefore I want a fixture that is entirely under my control, and not under that of the patient.

Fig. 14 shows an instrument for expanding the lower arch in the region of the second molars when these teeth are tipped lingually, which, it seems to me, is well adapted to perform the task.

I do not doubt at all that in Dr. Jackson's hands this system is the most satisfactory to him. As every man cannot be as skilful in the use of one kind of gold as he is with another, so it is with different systems of orthodontia.

Dr. W. E. WALKER, New Orleans, La. I have had experience with the Jackson system and also with other appliances for depressing the lower incisors, allowing the molars to rest and extrude at the same time, and therefore I must take issue with the statement of the gentlemen who preceded me, that that cannot be done. Of course he is only expressing an opinion. I believe, however, that Dr. Jackson could say, and I will say, that there is no doubt about it at all.

But coming to the paper itself as to

the Jackson system: As long ago as ten years I gave clinics with it, and have used the system quite a little, and am therefore glad to be able to speak in its behalf, using as I do the best I can derive from the various systems presented to the profession. With reference to opening the bite by soldering a piece of metal over the molars attached to the Jackson crib: In one case I soldered to the metal another piece in the shape of the letter W, on each side of the mouth, which struck just in front of the lower cusps, and carried the lower jaw back and the upper forward in a case of lower protrusion, and it worked very satisfactorily. I might mention for the benefit of those who work with this system, that they will find the electric soldering iron a great advantage, in that it retains the heat while one is working with it.

Dr. W. O. TALBOT, Biloxi, Miss. I have not had sufficient experience with the Jackson system of appliances to speak with authority about any of the forms he has shown tonight, but have used some of them, and I must say with success in a number of cases. In the use of this system I have been impressed with the importance of perfect adaptation of the appliances to the teeth. I also appreciate the points which were brought out by Dr. Jackson in regard to the length of the arms of the appliances. I wish to compliment him on the great amount of skill manifested in the detail of construction of the various appliances that he has devised to produce these movements. In cases where the patients cannot be seen as often as would be necessary were any of the other systems used, these appliances come in very nicely, and I have been using some of them to advantage in such cases. Of the value of the appliances for producing the exact movement that has been shown on the screen I am not prepared to speak, because I really think that in any system of appliances the man who has had experience with them is better prepared to speak than those who merely theorize on them. I think that where we have patients under our control, and can see them often, many of them can be treated

in a shorter time with other systems than the Jackson. I use more of the arch appliances with the clamp bands cemented to the teeth, known as the Angle system, being a student of that system of correcting dental irregularities. I cannot tell in the unfinished cases as shown here whether or not the desired relations for all the teeth were secured. There was one case shown in which Dr. Jackson used the appliance for harmonizing the relation of the arches, and I wish he had shown us the profile view of the cases after completion of the treatment. I hope he has the casts with him, and that we may see them tomorrow. We cannot tell from a front view of the casts whether the mesial relation was established as would be desired.

I do not remember whether Dr. Jackson showed a cast of the finished case of unilateral lingual occlusion.

Dr. JACKSON. I did not.

Dr. TALBOT. I have had some experience in the treatment of these cases, and I have met with good success by using the arch bar, and pitting one whole side of the arch against one tooth on the opposite side, beginning with the most distal malposed tooth, but I have never tried the appliance shown in that class of cases, and therefore cannot speak with any authority on the results obtained in this case.

I wish to thank the essayist for the paper, and to say that I enjoyed it very much.

Dr. W. D. MONROE, Washington, D. C. I do not know of any study that comes before us that is as neglected as this. I have followed Dr. Jackson's work for a good many years, and never miss an opportunity to see his casts and to hear his papers; and as for myself, I think it is the only system that I have ever been able to get anything out of—really the only system that we can call a system.

It is one of the most discouraging things in the world to start to make a Jackson appliance after being accustomed to using hard solder. However, after becoming familiar with the procedure, and following the few points that Dr. Jackson gives us, the appliance can be readily

made, and will go to place as nicely as any appliance you have ever used, and it will stay in position. I think if any man will follow Dr. Jackson's ideas, and apply a little common sense to this work, he will have success, and Dr. Jackson is always ready and willing to give any points regarding the system. As for myself, I cannot say too much for it, and I am only sorry that so few are here tonight to discuss the paper.

Dr. J. A. GORMAN, Asheville, N. C. I enjoyed the demonstration of the making of the appliances, but greatly regret that Dr. Jackson did not exhibit more of the cases completed—showing the final occlusion.

Dr. JACKSON. Occlusion is not the subject under discussion this evening.

Dr. GORMAN. Speaking of driving the teeth down: I really think that instead of driving them down in their sockets and holding them there, we have a tendency to bring the other teeth up, making a happy medium.

Dr. PEETE. Dr. Walker spoke of my saying that it was impossible to produce the results Dr. Jackson has shown with his methods. I do not think I said that, but what I meant was that I believed Dr. Walker, being familiar with the system, can do things with it that others not equally familiar could not possibly accomplish.

Another thing I wish to say: In reference to the spreading of the lower arch in the neighborhood of the molars, I can think of no plan which is more effective than that which consists in the application of the spring wire to the second molar tips when these teeth are only partially erupted. According to my system, it is difficult to place my anchor bands on those molars when they are partially erupted, but with the spring wire I can see that it is perfectly possible. I think there are a great many things in his system that I like, and a great many that I do not, although I may think differently after seeing Dr. Jackson's clinical demonstration.

I do not think, however, that it is easy to depress these teeth by the natural occlusion. We find when the teeth become

tender that the patient will not apply the necessary force, therefore I like to have a force that is under my control.

Dr. JACKSON. Tell us how you do it.

Dr. PEETE. By the application of anchor bands and expansion arch. In the cases where the lower incisors impinge on the gum, there is seemingly a shortness of the molars and bicuspid. Here the question arises, Shall we depress the incisors or raise the molars and bicuspid?

By a careful study of the casts, face, and lips, you will frequently find that one has to have recourse to both procedures.

Having decided thus, I apply the anchor bands to the molars, place the expansion arch in position, and attach to it the anchor bands with wire ligatures or spurred bands and ligatures. In this way I lift the molars, and at the same time depress the incisors with hooks made of thin metal, engaging the incisal edges, or with ligatures, according as to whether I want to move them labially or depress them only. A force is thus produced that is positive and under control of the operator. In the movement of the inlocked incisors by means of the expansion arch with ligatures and screw, in all such cases it is absolute, and only a short time is required to do it, with a minimum of pain and little or no inconvenience to the patient.

Dr. J. ROLLO KNAPP, New Orleans, La. I think we all regret that there are no more present to discuss the paper to which we have listened with so much pleasure this evening. Dr. Jackson is a man, doubtless, of a great deal of skill and ability, particularly in regard to orthodontia, but there are, to my way of thinking, some other very good methods. I was in Chicago a short time ago, and attended a meeting of the largest local dental society in the world. I saw there a great many beautiful casts and some practical cases shown by Dr. Case. I also had the pleasure of visiting Dr. Angle's office in St. Louis, and there I saw about two thousand casts of some very difficult cases that he had carried forward to a successful termination. There is

also a Dr. Knapp—not myself—whose appliances I see advertised in the journals, and he too must accomplish wonders in these directions. It is a pity that there are not some of these men here to discuss this paper, and to answer some of the questions asked by Dr. Jackson. They must do it in some way, I imagine.

Dr. JACKSON (closing the discussion). I am pleased with the discussion of the paper, but I should judge from the remarks of some of the speakers that they have but a very slight knowledge of my system, and of what can be accomplished with it. I am here this evening to show how to open the bite, and how to depress teeth in their alveoli. One of the speakers says that he does not think I can depress teeth in the manner I have described. He has not told us very clearly how he depresses them. The method he gives of adjusting an expansion arch and tying the teeth to it depresses the teeth in some cases and does not in others. The tying of teeth to an expansion bar has proved a most uncertain method.

He speaks of the teeth being made sore by the use of my appliances. The teeth do not get uncomfortably tender if the appliance is managed at all intelligently, and the patient can masticate easily at any stage of the regulation. That is why I claim that this is the "humane system," and up-to-date orthodontia.

I would like to ask Dr. Peete how often he sees his patients each week.

Dr. PEETE. Once or twice.

Dr. JACKSON. I see my patients usually once a week, sometimes once in two or three weeks, the apparatus being removed by the patient for cleansing. Dr. Peete says that my appliances are slower in action than those he uses. Any amount of force desired can be applied. I think after Dr. Peete sees the casts that I am going to exhibit, he will be able to speak more fairly on the subject.

I am showing you a painless method of accomplishing difficult work—work that we have not known how to accomplish painlessly before.

As I have stated, I have been able to reduce the movement of the teeth to practically an exact science. It is impossible

to accomplish this with an expansion bar, as when it is adjusted and additional force is applied to a bicuspid or canine tooth on one side of the arch, the force imparted tends to drag outward some of the teeth of the opposite side of the arch, which in many instances is objectionable. With my system, we have the advantage of using definite anchorage on one side of the arch, and the teeth are not loosened in their sockets in forcing outward one or all of the teeth of the opposite side of the arch.

One of the great advantages I claim for this method is that the regulating is done in definite steps, as the changes can be appreciated each time the case is examined. This is accomplished, as I have described, by making a tracing of the appliance before force is applied, and a dot mark by the side of the tracing of the distance it is desired to change them so as to give the required degree of force. The appliance is then bent to conform to the new marking, and the tracing kept as a record.

Regarding the time employed in the regulation of teeth in special cases, at the demonstration tomorrow I shall present casts showing conditions before and after correction with the apparatus in place. This you seldom see with other methods. I will show how both arches are expanded at the same time with no discomfort to the patient, and I challenge anyone to show as marked expansion of the arch, accomplished with as few visits of the patient.

Dr. TALBOT. Dr. Jackson has asked if those who pay particular attention to occlusion ever show their cases with the apparatus in place. I would like to ask him if he has read the proceedings of the American Society of Orthodontists; if so, he will see there a great many cases shown with the apparatus in place.

Dr. JACKSON. If Dr. Talbot will look over those proceedings and those articles, he will see that they are principally by Angle students, and the same line of thought runs throughout all the articles. I will repeat that you seldom see the apparatus in place on the cast. We see pictures in advertisements, etc., but do

you see the appliance on the cast with the ligatures in place?

Dr. TALBOT. Plenty of them.

Dr. JACKSON. I have shown apparatus which the patient can remove in order to cleanse them, and to cleanse the teeth, there being no excuse for congestion of the gums; and the operator does not have a filthy mouth to contend with—frequently so filthy that he has to wash his hands a second time to deodorize them, and this in the day of prophylaxis. I am showing a system by which one can see and attend to more patients with fewer visits than by any other method of which I know. Remember, gentlemen, that I have been in the field for a considerable number of years, and have tied and twisted ligatures. Only last year, I saw students in colleges twisting ligatures in the mouths of patients for the correction of irregularities, and the tears running down the patients' cheeks. We have nothing of that kind to contend with in my system.

In regard to the application of the method, these appliances have been made by an expert in about thirty-five minutes. How much time is spent in making apparatus and applying it to position with other systems, requiring valuable time that might be given to other patients! I am here to show how to do these things, having no other interest than to help the profession and the patients. I want to thank you for your kind attention.

The next order of business was the reading of a paper by Dr. A. PERCIVAL BURKHART, Buffalo, N. Y., on "Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation," as follows:

RUBBER-DAM METHOD OF ABUTMENT PREPARATION, INTERCHANGEABLE FACINGS, AND CEMENTATION.

"Modern crown and bridge work belongs to the department of dentistry formerly termed *mechanical*, but the judgment, skill, and scientific information required place it far above ordinary mechanical dentistry, which has sunk to a

low estate since the introduction of vulcanite."

It can also be said that no branch of dentistry is more abused by avaricious and unscrupulous men, because wilfully they employ it when other means are indicated. Abuse is also shown, as observed by the conscientious dentist, in faulty work and slovenly prepared abutments, and in hideous and disfiguring gold crowns in the anterior portions of the mouths of thousands of patients.

You will observe that bridge work has its dark side, but it also has its bright side, and is a blessing and a comfort to patients when it is honestly recommended and artistically constructed. The interests of the patient should be the guiding principle in all our operations, and a careful examination should plainly and definitely indicate the best system suitable to his case. To arrive at a conclusion, the mechanical portion of the operation is not the only element to be considered; pathology and therapeutics must not be overlooked, if we intend to treat our patients as we would like to be treated, were we to undergo a similar operation.

I shall not attempt to enter into a discussion of the mechanical phase of the subject under consideration, so far as mechanical methods are concerned in the construction of crowns, but shall direct your attention to the preparation of abutments, detachable and interchangeable facings, and cementation.

Close observation for a number of years has convinced me that the preparation of abutments does not receive the average conscientious attention it should, and justifies this conclusion: A dentist who will insert a single crown, or a bridge, upon an inaccurately prepared abutment or abutments, and depend largely upon the cement to keep the crown and bridge in position, is not honest with himself, and certainly has not treated his patient in a manner he would be willing to be treated himself, were he to undergo a similar operation.

Brooklyn bridge, one of the marvels of engineering skill and mechanics of the nineteenth century, and similar struc-

tures which have safely carried millions of humanity from shore to shore, would long since have proved disastrous to life had the same proportionate indifference been shown in the preparation of abutments and piers as is displayed too frequently by many members of the dental profession when approaching and preparing the abutments for a bridge in the mouth of a patient. The bridge in the mouth, as compared with Brooklyn bridge, is infinitesimal, but the underlying and governing principles of construction of the two are alike. Foundation exposure is essential, and truly is this so in the mouth of a patient. And how is this best attained? I answer, By the use of rubber dam held in place by wide-flanged clamps, and sometimes by ligatures; most frequently, however, by clamps. The rubber dam I have thus employed for a number of years, and with pleasing results.

The careful orthodontists obtains accurate casts of the mouth of his patient, so that he may be enabled to study the case under consideration. This rule I also follow in cases requiring medium or large-sized bridges. With the casts articulated I am enabled to devise a safe line of construction from start to finish, and having formulated my plan, I proceed with the preparation of the abutments. After adjusting the rubber dam over a sufficient number of teeth, and extending it over open spaces as quickly and painlessly as possible, I reduce the tooth-substance and accurately prepare the abutment or abutments, unhampered by saliva or secretions of any kind. There are exceptions to all rules, therefore I do not want it to be understood that in every instance I adjust the rubber dam, although I do so in the majority of cases.

In the preparation of the abutments humane treatment should be exercised; therefore, previous to the adjustment of the rubber dam, the gum surrounding the necks of the teeth should be treated with cocain, which will enable the operator to depress the rubber dam painlessly by means of clamps and ligatures, and thus produce an exposure of the necks

of the teeth to a surprising degree. Nowhere in the mouth will the painstaking operator appreciate exposure of tooth-structure more than in cases of forward tipping of molars or bicuspid, especially molars. The use of the rubber dam will be found particularly useful in adjusting the Logan, Davis, Twentieth Century, or any other make of porcelain crowns on the anterior teeth. With the rubber dam in position, I proceed with the reduction of tooth-substance, using the knife-edge carborundum disks made by Lee Smith & Co.

With the sharp-edge disks one can slice down the bulging portions on the anterior and posterior, and labial and lingual surfaces of molars and bicuspid, and this when accomplished will render the tooth almost square shaped. Next, carry the now blunted disks backward and forward over the occlusal surface, thus avoiding long-continued pressure and undue friction at one spot. This variety of disks does away with the violent jarring and friction which the coarse stump wheel produces on the nerves of the patient. Having reduced the sides and occlusal surface, I next complete the final shaping and polishing of the abutment with sand-paper disks. My work is simplified, and the tooth being operated on is kept cool by means of a stream of compressed air directed upon the tooth by an assistant.

In the preparation of abutments, if the teeth are extremely painful, by means of pressure anesthesia I am enabled to shape a tooth to my liking, without causing the patient an undue degree of pain.

Some of my fellow practitioners may consider the use of the rubber dam a waste of time, but they are certainly mistaken, as it means instead a great saving of time. Some may consider it impracticable, but to each I can say, experience is the best teacher. I have had the experience and know whereof I speak, and am sure that if my esteemed fellow practitioners will give the method I have outlined a reasonable trial, they will obtain surprising results.

DETACHABLE AND INTERCHANGEABLE FACINGS.

With the introduction of crown and bridge work, a surprising demand for porcelain teeth or facings arose; but after the lapse of years, the leading tooth-manufacturers have failed to produce anything besides the pin tooth. It is true that better shaped teeth and a greater variety of molds are in existence today than at the time of the introduction of crown and bridge work, but so far as durability and strength are concerned the porcelain is no better at the present time than it was formerly when used for artificial work on gold and silver.

Experience has shown clearly that while the ordinary pin teeth will do for gold and silver plate, they are found deficient in crown and bridge work. After exercising the greatest care with pin facings, the careful operator is always uncertain as to the final outcome. Discolored facings—the result of high heat in soldering—and broken and checked facings confront him, and the conscientious operator becomes sick at heart. It is likely that many within the sound of my voice, after having exercised all the skill and care possible in the construction of a bridge, have been confronted with results such as just pictured, and thus ideal work has not been obtained.

Pin facings have been our great annoyance in the construction of bridges and even single crowns. In the main they are defective when proportion is considered. They are too narrow at the neck, as compared with the breadth of the incisal edge, and as a result, unsightly V-shaped spaces are to be seen between the teeth when a case is completed. These large spaces are particularly unsightly when considerable absorption of gum tissue has taken place, but happily I have been able to avoid this glaring defect by the use of a comparatively new product—a detachable facing.

Pin facings, as stated, are objectionable when the danger of checking and lack of proper proportion are considered. To these faults must also be added

that of change of color due to the high heat essential in soldering. Naturally the question arises, Is there any product which overcomes the defects mentioned? If there is, the facing must be detachable and interchangeable, thus permitting the production of a crown or bridge without subjecting the porcelain to heat at all during the process of soldering; it must be of proper proportions, nearly as wide at the neck as at the incisal edge, and thus with the approximal surfaces nearly parallel the unsightly V-shaped spaces will be avoided.

Ever anxious to take advantage of every mechanical improvement in dentistry, I hailed with delight the Mason facings when they were placed on the market. The product was never fully appreciated by the dental profession. Since the introduction of them, further advances have been made, and notably Steele's interchangeable facings. A little over two years ago I began using the latter, and with satisfactory results. I never worry over checked or discolored facings now. Think for a moment what it means to use a facing of this character! It means a bridge with facings free from checks and discoloration and devoid of large V-shaped spaces, display of gold between facings, and unsightly gold tips. The Steele facings are valuable when a bridge is inserted shortly after extraction, and later, when absorption has taken place, the facings can be replaced with longer ones without the necessity of removing the bridge. Time is saved in the construction of crowns and bridges, and if repairs are needed they can be made easily and quickly. In order to get the best possible results with the Steele facings, the instructions laid down by the manufacturers—chiefly so far as cleanliness of the backings and facings is concerned—must be followed. With each facing comes a metallic backing either of gold or platinum, as the operator may elect. The facings slide on and off easily, and this condition must continue during the whole process of construction.

My early experience was somewhat annoying when constructing an arched

bridge. I found that, after soldering, the facings would bind on the backings, but I overcame this by the following method: After grinding the facing and fitting the backing to it, I remove the latter and invest it, and then I fully back the metallic backing with 20-k. solder. This process I apply to each dummy and then assemble all on the model, leaving for the final soldering only the joints between the backings; requiring little solder, the backings do not warp, and allow the facings to slide on easily. I am convinced that the best results are obtained either with pin or with interchangeable facings, when each crown or dummy is constructed separately, and then all assembled and soldered.

Instead of crystal cement, I now use Evans' gutta-percha cement for attaching the facings to the backings. I prefer gutta-percha because the facing can be removed without injury if subsequent removal should be found necessary.

I have had dentists say, "I prefer pin facings because they are cheaper than the interchangeable ones." The dentist who reasons thus makes a mistake, and the quicker he divests himself of the idea of cheapness of materials when constructing crowns and bridges, the better for him. The ethical dentist should always use the best materials, in order to place himself on a high plane and have the conscious satisfaction of having given his patient the best obtainable, which in turn will justify him in demanding a fee commensurate with his efforts and skill.

CEMENTATION.

While pin facings have been a source of annoyance, misfortunes from another source have come to me: I refer to cementation. The cementation of crowns and bridges has been with me a subject of close study. Many times, for various causes, have I wished for a method to remove easily a crown or a bridge; my desire was not gratified, however, so long as I continued the use of crystal cements. Patients have come to me and said, "Doctor, that bridge you set for me bothers me, as one or more abutments

are sensitive to heat and cold;" or the patient would report a cap loose on an abutment, while the others were perfectly firm. To remove a bridge, as suggested by safety and duty, involved, under such conditions, tremendous labor, mutilation of crowns, and pain to the patient. The conditions mentioned confront nearly every dentist, whether he be of limited or of extensive experience.

Many valuable abutments are destroyed because of the difficulty attending the timely removal of bridges set with crystal cements. For years I have used gutta-percha almost exclusively, and with great satisfaction, in setting single crowns, and about three years ago I began using Evans' gutta-percha cement for setting bridges. At first I used it cautiously, but now I use it almost exclusively. I can quickly and easily remove a crown or bridge now, should occasion require it, and avoid mutilation of the crowns and abutments. I now make it a rule to instruct my patients to return for examination at stated intervals, and if dangerous symptoms present themselves, I remove bridges or crowns and perform such services as will best benefit my patients. Had I used gutta-percha cement earlier in my practice, and observed the rules I do now, I should doubtless have prolonged the life and usefulness of many abutments.

I believe it is good practice, from a sanitary standpoint, to remove bridges from the mouths of our patients at stated periods, and thoroughly cleanse and deodorize them. Fixed bridges, however well and carefully constructed, become foul after a time, and sometimes contaminate the breath.

I am sure the suggestions that I have made regarding my method of abutment preparation, the use of Steele's interchangeable facings, and gutta-percha cement, will be of value if given a fair trial.

Discussion.

Dr. J. D. PATTERSON, Kansas City, Mo. I was very much pleased to hear the paper. I am interested in the Steele facing, and am using it with a great deal

of satisfaction. However perfect our operations may be in using pin facings and in soldering them, there is always, with the most successful as well as with those who are not so successful, a great deal of dissatisfaction because of checking the facing and the difficulty of making a perfect repair without mutilating a bridge or crown. Sometimes the replacing of a facing proves very satisfactory, but often it is not so; and I hail the Steele facing as the best that I have ever tried, and I think I have tried all of the removable facings. The simple objection which I have and of which I have often spoken, is that the backings should be made of platinized gold or platinum-iridium.

Dr. Burkhart spoke of the backings being made either of platinum or gold. They are made of something similar to platinoid. I have entirely discarded those made of so-called platinum and use the gold ones altogether, but I think these backings should be made of iridio-platinum. Sometimes, in forcing these facings on, the barrel is ruined, or melted down in soldering, but if they were made of platinum-iridium they would be much stronger. Aside from this one objection, it is the most satisfactory way of placing facings of which I know.

Dr. N. C. LEONARD, Nashville, Tenn. I am impressed with the need of a better porcelain facing and one that is amenable to our needs. While I am not familiar with the Steele facing, I am prepared to believe that there is quite an advantage in its use.

The only other point to which I wish to refer is the cementation of the bridge with gutta-percha. I appreciate the immense advantage of this method, because of the fact that it is often necessary to remove a piece of work after it has been cemented on, a task difficult to accomplish without mutilating the bridge or crown. I think the essayist is quite right in saying that it is frequently important to remove a piece of work to cleanse it. I have been accustomed to the use of gutta-percha in cementation, but am not familiar with the character of cement that he refers to. I have been in the habit

of filling the contour portion of the crowns with gutta-percha, and then cementing with the ordinary cement, so that when removal is indicated, by warming the bridge slowly the gutta-percha will be softened, when the bridge can be slipped off of the abutments.

Dr. A. J. COTTRELL, Knoxville, Tenn. We are of course very much interested in the remarks of Dr. Burkhart on the use of the interchangeable facings and gutta-percha cement. I think that a cement which permits of the removal of a bridge would be acceptable to any dentist; this is not a debatable subject, it is an accepted fact. But there is one point that I wish to emphasize, namely, the essayist's idea of the application of the golden rule in the making of bridges. I believe that if each dentist, when a patient is in the chair, were to say to himself, "If this were my own mouth and my own bridge, how would I like to have the work done?"—that if we were to apply that reasoning to each and every case our patients would be better served, our reputations would be wider and broader, and our consciences would trouble us less. Gentlemen, do unto others as you would have them do unto you.

Dr. BURKHART (closing the discussion). Dr. J. D. Patterson spoke more particularly about the form of the backing. The Columbus Dental Manufacturing Company, who produce these facings, make three qualities of backings—platinoid, platinum, and gold. I know about the platinoid backing because I used it in my earlier practice, much to my sorrow. With the backings that I have used in recent years—namely, the platinum and gold—I have had no difficulty. Dr. Patterson also said that the manufacturers were open to suggestions. This is true. I made some suggestions recently which the company that manufactures these teeth has under consideration. I am sure that there is not a single dentist who, after once using these facings intelligently, will discard them. While I believe the Steele facings have many advantages over other products, I think that American genius and ingenuity will eventually produce something

which will be still better, but at the present time they are the best we have.

Dr. Cottrell said that we should follow the golden rule in all our work. How frequently are crowns and bridges put in without at all considering the interests of the patient! In the early portion of the paper—and this is a point which was not discussed at all—I spoke of the use of the rubber dam in the preparation of abutments. This is an idea that I have never heard discussed at any meeting, and I have presented it on two occasions. But I can say to you that if you will use the same care that I do, you will not have cause to regret having adopted this method. By this means the tooth around the margin of the neck will be exposed to a degree that will astonish you, and will enable you to accurately shape the abutments.

There is but one other suggestion that I desire to make. I intended to have spoken of it in the paper—the investment of single crowns and bridges. I make a point of saving every box in which sand-paper disks are put up. In these boxes I invest my cases preparatory to soldering, whether it be a single crown or a bridge. In the majority of the boxes a small bridge can be placed. The advantage of this method is that the box acts as a matrix, confines the investment, and does not allow the investment material to spread, as it does, for instance, on a piece of blotting paper, and consequently forces the material close into the joints of the backings and facings. When I invest a bridge I secure a pasteboard box a trifle larger than the bridge, and when the investing material hardens I scrape off the pasteboard and trim the investment if necessary. Save all pasteboard disk boxes; they will be useful.

The next order of business was the reading of a paper by Dr. C. N. THOMPSON of Chicago, Ill., on "Reflected Shadows Accompanying Porcelain Fillings." Dr. Thompson was not present to read his paper, and it was therefore read by Dr. A. H. Peck of Chicago.

[This paper is printed in full at page 438 of the present issue of the Cosmos.]

Discussion.

Dr. L. E. CUSTER, Dayton, Ohio. I think the paper contains many new points on the construction and building up of inlays. It is true that if we at this date possessed a translucent cement, it would overcome the shadow problem to a large extent, but those which have been produced so far are not adhesive, and consequently we have to rely on mechanical anchorage. I believe Dr. Reeves, who introduced the building up of inlays in different colors, has been able to a large extent to overcome the shadow problem, but the essayist in this paper has gone a step or two farther, and has, I think, given us something considerably in advance of the method of Dr. Reeves. He tells us that one of the layers of porcelain should be of a red or pinkish color. How far that will prove to be a good step I do not know, but I believe it is well for all of us to at least give it a fair trial. It seems entirely reasonable as laid down in the paper.

I was especially impressed with the suggestion that we cover the approximal surface of an inlay, where it approximates a metal filling, with white porcelain. I believe there is a good deal of truth in what he says regarding that point.

There is no problem so disappointing to the dentist who is working with inlays as the shadow problem. We feel at this date that we have been very successful in securing these fillings in position, and I think that we should feel thankful to anyone who will aid us in the solution of the shadow problem. For that reason I think we should accept a paper of this kind with great thanks.

The next order of business was the reading of a paper by Dr. L. G. NOEL, Nashville, Tenn., on "Setting Crowns and Bridges with Gutta-percha."

[This paper is printed in full at page 453 of this issue of the COSMOS.]

Discussion.

Dr. A. P. BURKHART, Buffalo, N. Y. As you will probably have noticed in my

paper this morning, I am now and have been for many years very much interested in gutta-percha. The essayist said we knew gutta-percha to be an excellent temporary filling material in the treatment of teeth, and for the retention of a crown placed on a root the condition of which remains uncertain. Now, if it is a good material with which to test a crown for six months, it should be equally as good for permanent use. I have for many years used gutta-percha almost exclusively in setting single crowns. I began by using the plain gutta-percha. I discarded that, however, and began using the Evans gutta-percha cement. I also used S. S. White temporary stopping, and I found, as Dr. Noel stated, that this seemed to harden in the cavity to the density of vulcanite. As far as the preservation of the root is concerned, gutta-percha certainly preserves it better than do ordinary cements.

There are those who use the ordinary gutta-percha for setting crowns, and I think with good results. One method is by coating the pin with a solution of gutta-percha, allowing this to thoroughly evaporate, then filling the root with crystal cement and forcing the pin through the cement. This is a very good method, but in my experience the Evans gutta-percha cement will give still better results. I use gutta-percha for setting bridges in ninety per cent. of all cases, and thereby accomplish results which are highly satisfactory. I can best illustrate by citing a case in practice. I had occasion to remove a bridge—one I had set about a year ago—which rested on four abutments, two molars and two bicuspids. By drying the abutments or caps and then heating them, in a little over eight minutes I removed the bridge without mutilating a single abutment. It is an ideal material for permanent use, one that enables us to remove a bridge easily if occasion requires, and by its use we are benefiting ourselves and our patients.

In discussing the cementation of bridges with gutta-percha, I have heard dentists say "There is danger of burning

the mouth." If you use a little care, there is no difficulty. The great trouble is in being too hasty in trying to set the bridge—there is where the danger of burning the mouth comes in. With the Evans gutta-percha outfit there are two kinds of gutta-percha furnished—pink and white. The pink I use for bridges and the white for single crowns. Now, by carefully heating the bridge on the iron to the proper temperature, the former can be easily placed in the mouth without any danger of burning the tissues.

When you first force a bridge to place with gutta-percha, you will find a little curling up of the excess of gutta-percha around the abutments. Allow the patient to go away, and on his return in a few days, remove the excess. I would not advise cutting this away at the original sitting, but allow the gutta-percha to harden perfectly, for then it may be removed without endangering the portion protruding from the abutments.

Dr. NOEL (closing the discussion). In my efforts to be brief I fear I have sacrificed clearness, and I want to elucidate a few points slightly. I have experimented with the various forms of gutta-percha in solutions, but with most of them like the Evans, I have had trouble in getting the crown or bridge to place. If after laboring assiduously to make a beautiful piece of bridge work we fail to set it properly, we commit thereby a mistake which is very troublesome to correct. It was my desire to get a preparation that would not shrink so much as to allow of the crown coming out too easily, that led me to use zinc oxid. In the setting of a crown or bridge where it may have to be removed one or more times, or in the repairing of a broken facing, the gutta-percha spoken of by Dr. Burkhardt is the ideal material. My idea was not so much to get a permanent material as to devise one that would hold the crown, and not undergo too much shrinkage. To prevent the rapid evaporation of the chloroform I decided to use it in combination with equal parts of eucalyptus. The aristol is used on account of its antiseptic prop-

erties, for I believe it is one of the best antiseptics. Dr. White suggested this idea to me and I have used it with a great deal of satisfaction ever since.

The next order of business was the reading of a paper by Dr. H. H. JOHNSON, Macon, Ga., on "Forcing Eruption: a Case in Practice."

[This paper was printed in full at page 266 of the March issue of the COSMOS.]

Discussion.

Dr. S. H. GUILFORD, Philadelphia, Pa. The operation described and illustrated in the paper was certainly a remarkable one. It is an operation which is not often attempted or successfully performed, but in this case, as shown by the casts, it seems to have been a complete success. It is a different operation, because it is hard to get at the tooth in order to attach the appliance, and it is no easy matter to turn the tooth and to lead it to place. It is also sometimes attended with a great deal of danger. I remember that some years ago a case somewhat similar was presented before the Pennsylvania State Dental Society; the operator succeeded in getting the tooth into place, but after he had done this he found that he had stretched the pulp to such an extent as to devitalize it. I would like to know if anything of that kind happened in this case.

Dr. JOHNSON. No. The pulp is in a healthy condition; but during the operation I found there was some danger from that, and watched it very closely, and when I found the tooth erupting too rapidly, reduced the size of the rubber band so as to decrease the tension on the tooth.

Dr. GUILFORD. Of course, if it happens that the pulp is devitalized, it is not such a serious matter unless allowed to remain too long in that condition. If as soon as the tooth has come to place it is discovered that the pulp has been devitalized, it can be readily removed, and the tooth not be much worse off, unless slight discoloration should result.

I want to congratulate the essayist on

the success of the operation. It is certainly a most commendable thing to bring such a tooth into its normal position and make it useful to the patient. If that had not been done, the other teeth would probably have closed together, with a deformity as the result. In any case of imprisonment of a tooth, an attempt should be made to bring it into place, because if it is not, the arch will be disarranged, and imperfect occlusion of the teeth be the probable result—something that we want to prevent in all cases.

Dr. C. O. KIMBALL, New York, N. Y. This case is especially interesting to me because of the success which Dr. Johnson has met with in treating it. Eight years ago I had occasion to treat a case precisely similar except that the canine was on the right side. The procedure which Dr. Johnson adopted seems to have been a very wise one, and the similarity of the two cases is my reason for speaking now. When the tooth was first located it was lying in almost the same position as the one described by the essayist, with the apex behind the lateral. Its position was discovered only after making an incision of fully one-eighth of an inch under the surface of the gum. It was difficult at that time to set any band on the tooth, or to determine accurately where it was to be placed. So instead of inserting a band—after satisfying myself as far as I could which would be the palatal aspect of the tooth—I made a little pit under the end of the canine on one side of it, and then, with the removable crib of Dr. Jackson's having a hooked wire spring, which curved around over the outer side and under the place where the deciduous canine was taken out—the hook end of this spring was inserted into this pit, arranging the spring so that it could be sprung off to be cleansed and reinserted. In this manner a continuous downward drawing motion was secured. The tooth yielded very readily and came out into line. We then found that the movement was not sufficiently rapid, and therefore adopted the course followed by Dr. Johnson, of inserting a little loop in the end of the tooth, then pulling in the desired

direction to draw it firmly into place. The tooth which has now been in position for seven or eight years is, at the present time, in a normal condition in every respect.

Dr. Johnson's case calls to mind another case which I have to operate upon this fall. It is the case of a young lady one of whose lateral incisors is very crooked and projects considerably over the central. I was at a loss to understand why it had come down in that way, there being no permanent canine on that side. After having had an X ray made I found that the canine was being forced against the root of the lateral incisor. I have been watching the case with the X ray, and we propose to perform the same operation—that is, cutting a retaining point in it and drawing it into position—and we hope for the same success that has attended the operation of our essayist.

The next order of business was the reading of a paper by Dr. W. L. ELLERBECK, Salt Lake City, Utah, on "Comments on General Practice."

Dr. Ellerbeck not being present, the paper was read by Dr. A. J. Cottrell, Knoxville, Tenn.

[This paper is printed in full at page 1179 of the December 1906 issue of the *Cosmos*.]

Discussion.

Dr. A. J. COTTRELL, Knoxville, Tenn. I read the paper with a great deal of interest, and there are a few things I would like to say in regard to it. I, like Dr. Ellerbeck, am very much in doubt about many of the things in dentistry. I detect in his paper the thoughts of one who wishes to remove the hindrance of conflicting ideas and theories, and I, also, would be glad to see the time when some of these theories shall be settled beyond the shadow of a doubt. However, I am not inclined to be pessimistic in this matter, because the theories in regard to dentistry, as in every other great movement—political, educational, religious—are the result of evolution, and no great reform has ever been accomplished at one master-stroke. There are some

things that are settled beyond the shadow of a doubt. The question as to whether the idea of "extension for prevention" is good or not is settled, for me. There is no doubt in my mind, nor in the minds of any of us, I think, as to whether there is a use for the porcelain inlay in dentistry; that is settled. Yet there are some problems that cannot be settled, because the personal equation must enter into their solution.

There is not time to discuss the various points in the paper, but I would like to add just a word. We all like to hit at the colleges and the people interested in them. If we can find no one else to criticize we jump on the colleges. We are all bound to admit that a great many of the students who leave dental colleges are not as thoroughly equipped as they should be for the practice of dentistry—that there is room for improvement. This I admit, and we all know it, but there the question of evolution comes in again. I would ask Dr. Ellerbeck, or any of those people who have a weakness for criticizing the colleges, to compare the dental colleges of today with those of two decades ago. Compare them with those of even ten years ago, and the advance is apparent. Consequently I say I am not pessimistic in regard to our system of education. I admit that it is not complete, but those who make education a study are pressing forward rapidly, and in a most conscientious way—doing the best they can; let us give them a word of commendation once in a while, instead of continually ripping them up.

Dr. WM. CRENSHAW, Atlanta, Ga. I think Dr. Ellerbeck has presented us with a very interesting paper, and one which we shall have to read and study before we can properly appreciate it.

He seems to think, in the preamble of his paper, that the colleges do not improve the rank and file of the profession today. Although I am interested in the teaching of dentistry, I believe that what Dr. Ellerbeck intimates is true to a greater extent than the profession realizes.

I believe there is an opportunity in

what he suggests as to the feasibility of a commission to settle certain mooted methods of practice. In some schools we find, for example, that they are teaching exclusively the manipulation of cohesive gold, as they consider it the best form of that filling material for saving teeth; while in others the use of soft or non-cohesive gold is advocated as the only correct thing. These methods are so far apart as to results that nothing but confusion in the minds of the students comes of it. Again, for illustration, if each of the physiologists of today were to present as proper teaching for students in medicine and dentistry his own opinion of the circulation of the blood, digestion, and assimilation of food, we would have as many opinions as we have teachers—but they do not do that. These matters are settled by the authorities on the subjects, and although you might employ a half-dozen physiologists, you will find that they all agree with regard to circulation, digestion, and assimilation. Now, when these things are settled, you can teach something definite, because there is a basis to work on. It needs to be as the law in our courts, under which the lawyers work, which comes from a settled ruling—a head and authority. I regard the suggestion as a good one—good for our profession, and of course for the public at large.

Dr. Ellerbeck states in his paper that cavity preparation on scientific lines is taught by Black, Johnson, Kirk, and others, giving credit for the present prevailing methods of preparation of cavities. These gentlemen have done their part, to be sure, but they have not originated what they are teaching, and it fatigues me somewhat to see this honor constantly misapplied, and the credit of it given to men who have not originated it; for the credit and the very soul of this extension for prevention, and about every feature of cavity preparation worth adopting, is due to Dr. Marshall H. Webb. He did not call his system extension for prevention, but that is what he taught, and the re-vamping of his teaching does not change or improve its principle. Some small modification may have been

made of some parts of his work, but Webb is the author of the system, and he should have the credit. I think the commission as contemplated by the essayist would find Webb's work settled, so that, as from the rulings of the Supreme Court, there can be no appeal.

He refers in his paper to the phenomenally rapid operator, and to the phenomenally slow one, instancing the man who prepares a cavity one day, fills it the next, and finishes the filling the third, taking three days to fill the tooth. Now this is ridiculous, and yet there are some operators who make themselves just as ridiculous by operating too rapidly. I have known operators to knock fillings out before finishing them, because of working too fast. Dr. Atkinson, great man that he was, once did this at a clinic. Conservatism will prevent us from working too fast or too slow. More than most specialists, the dentist must give the proper time and attention to his work, or it must inevitably prove a failure.

I think the essayist is rather over-alarmed at the deleterious effects of the dust arising from the excavation of teeth—dust which he intimates lodges in the cells of the lungs of the operator. I judge others by myself, and try to dodge this dust, and give it to the patient, to whom it belongs. Fortunately it is only occasionally that we are exposed to this.

The suggestion of the use of the matrix in guarding against the cutting of the gum is a new idea, and I think a valuable one in the preparation of the gingival surfaces of molars and bicus-pids, or at the cervical border of the cavity. This and other valuable thoughts are constantly occurring throughout Dr. Ellerbeck's paper.

With regard to the use of the particular tin cylinders referred to by the essayist, I do not think it good taste to say it, but for history's sake will state that I am the originator of these cylinders. Both the manufacturer, Edward Rowan, and Dr. W. D. Tracy, to whom our essayist refers, will confirm this statement. The difference in these cylinders and those made formerly by Rowan, is that the cylinders I suggested are made of

corrugated tin foil. These are softer and more readily adapted to the tooth-structure in connection with any matrix you may choose to employ.

The last thought I shall notice is the condensation of gold. But I shall not attempt to say anything on that portion of the paper dealing with the manufacture of porcelain inlays, bridges, crowns, etc., because these are out of my line of work, and I do not feel I could add anything of value.

In regard to the condensation of gold, I think that there is a limit to it, and that it is entirely possible to over-condense the material. This is more true of the soft than of cohesive gold, and yet I am convinced that over-condensation of cohesive gold destroys the usefulness of the fillings, particularly after leaving the margins, in a larger measure than we are aware.

Dentists of less experience than mine, and particularly those of more, will testify that with reference to soft-gold work, they have extracted teeth that had been filled by such men as Maynard, the Badger brothers, Emerson, and others. These practitioners filled teeth with various preparations of soft gold, and by methods that were not much more than stuffing the teeth, and yet they have been preserved for forty and fifty years.

Dr. A. P. BURKHART, Buffalo, N. Y. I would like to say a few words, and those few words are the outcome of the remarks made by Dr. Crenshaw relative to the filling of teeth in which soft foil may be used. He has well said that many of the fillings placed in many years ago, which can be almost picked out, have preserved the teeth for years. I have in my own mouth fillings that were inserted thirty years ago, in which the gold was put in by hand pressure, and they are doing good service today. I want to say in this connection that in filling, my greatest effort is to exercise pressure against the walls of the tooth. I think a filling of soft foil firmly laid against the walls of a cavity will preserve a tooth longer than an over-malleted filling would. I believe one of the greatest faults of the young men of the profession today is the over-

malleting of fillings. The fillings described by Dr. Crenshaw and the methods employed by him and others will produce the best and most lasting results.

The following was read by title, the time for adjournment having arrived:

Paper by Dr. E. PARMLY BROWN, New York, "The Inevitable Outcome of Crown and Bridge Work."

The chairman, Dr. Burton Lee Thorpe, then declared Section I adjourned *sine die*.

SECTION II: Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

Chairman—H. E. ROBERTS, Philadelphia, Pa.

Secretary—C. S. BUTLER, Buffalo, N. Y.

FIRST DAY—TUESDAY.

THE first meeting of Section II was called to order at 8.30 o'clock Tuesday night, September 18th, by the vice-chairman, Dr. W. R. Clack, Clear Lake, Iowa.

Dr. Butler announced that the chairman of the section was prevented from attending the meeting on account of having all his funds tied up in the bank which failed in Philadelphia recently, and moved that the vice-chairman of the section be instructed to send a telegram of sympathy to Dr. Roberts, and the regrets of the section at his inability to be present.

The motion was carried.

The first order of business was the reading of a paper by Dr. CHARLES McMANUS, Hartford, Conn., on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past who Helped to Build It Up"—being the report of the Committee on History—as follows:

THE REMARKABLE HISTORY OF THE PROFESSION, AND THE SPLENDID CHARACTER OF THE MEN OF THE PAST WHO HELPED TO BUILD IT UP.

I assure you that it requires a certain kind of courage—to call it by no harsher term—to present an historical paper before a meeting of this character. It would seem little less than cruel to take a body of practical dentists, whose thoughts are on the future of their pro-

fession, and force them to consider the state of that calling, if not a thousand, at least hundreds of years ago.

My good friend Dr. Wedelstaedt* has said, "Let us rather work for the future of our profession, its advancement and progress, than to be forever dwelling upon its past history." I thoroughly agree with him, and yet—well, the traditions of the dental art are so interesting, and the men who in all countries and all ages have worked to make modern dentistry possible are so worthy of remembrance that it seems as if every one of the young men, or women, who propose to devote their life to and receive their livelihood from dentistry should at some period of their career be given a chance to study the subject.

In the first report of your Committee on History, made seven years ago it was stated that "In the opinion of your committee it would be well for the future culture of the dental profession if no class were allowed to graduate from any college without receiving the benefit of a short course of lectures on the subject."

So I ask you this evening to listen patiently to what I have to say, to look at the illustrations (which are more human documents than pictures) not as if they were addressed to you, for to some of those present it is a familiar story, but as if they were being offered to the young man beginning the study of his profession.

* Trans. St. Louis Congress, vol. iii, p. 26.

I shall touch very briefly on our history previous to the time of the great Fauchard, the "father of dental surgery," whose career is so inspiring and the man so worthy of our affectionate remembrance. It will be unnecessary for me to more than mention the early pioneers in America, as their lives and portraits have been presented to you in the journals by Dr. Thorpe, as well as in a paper read by him at your last meeting in Buffalo.

In the limited time at my disposal I can only hope to suggest to you the possibilities of the subject, attempting in an hour to sketch to you what in some detail would require at least three or four lectures. I have selected, out of a collection of several hundreds, about fifty lantern slides of instruments and appliances as well as portraits which add vastly to the interest of the subject when presented before the average dental student. It is the belief of the speaker that, when we can properly impress the lesson of the remarkable history of dentistry and tell of the splendid men who, in all countries, have helped to found and maintain it, it cannot help but have a practical *ethical* value in building up the professional character and self-respect of the young students upon whom dentistry will largely have to depend for its future professional standing.

The speaker then traced the history of the dental art from the earliest records we have of dental medicine given in the papyrus of Ebers, which reaches back as far as 3700 years before Christ, calling particular attention to the various erroneous assertions regarding artificial teeth, and particularly gold fillings said to have been found in the Egyptian mummies, which are *as yet* entirely devoid of foundation. Slides were shown of Phœnician and Etruscan work, and mention was made of the early Greek and Roman writers upon the subject, with illustrations of the various implements and appliances of the time.

Passing on to the middle ages, the Arabians—Rhazes, the initiator of the operation of filling teeth, and Abulcasis (eleventh century), the originator of a

systematic prophylaxis—were given due attention. The first complete set of scalers, those of this pious and persistent prophet of prophylaxis, were shown on the screen.

Attention was then called to Giovanni d'Arcoli, who in 1450 was the first to put on record the use of gold for filling teeth, and a brief account given of Ambroise Paré, who has been styled "the foster-father of dental surgery." A rare portrait of Dr. Nathaniel Highmore was shown, as well as one of Van Leeuwenhoek.

Passing on to the eighteenth century, instruments from the work of Pierre Dionis were shown.

Attention was now particularly called to the great dentist Pierre Fauchard, "the father of dental surgery," whose life and works were described and illustrated. Little is known of the early life of this illustrious man, and the exact date of his birth is still a matter of dispute. A disciple of Poteleret, surgeon-in-chief to the king's ships, his early attention was directed to diseases of the mouth and teeth. Viau, an authority on the subject, says that he had tried several mechanical professions, and the knowledge of these was undoubtedly of value to him later in his career. He determined, after practicing in various towns, to test his success on a larger scale, and in 1719 went to Paris, where at this date, and even earlier, there were not only "tooth-pullers" on the Pont Neuf, but also dentists properly so called. Of one of the latter, Monsieur Carmeline, Fauchard speaks as an able and celebrated surgeon-dentist. In 1728 appeared Fauchard's great work "The Surgeon Dentist," in two volumes, with over forty full-page illustrations, a number of which were described and shown on the screen. This book was translated into German and published in Berlin in 1733; a second edition appeared in Paris in 1746, and a third appeared, after the author's death, in 1786. It has never been translated into English, which is much to be regretted. Following the usual custom of the time the work begins with a fine portrait of the author.

This is interesting for two reasons, the first being that Fauchard is shown to us as a person of distinguished appearance, and this gives us a hint as to the social condition of the better class of dentists in Paris during the reign of Louis XV; and second, because of the Latin verses annexed to the portrait, which Dr. Wm. H. Trueman has cleverly put into English rhyme as follows:

Whilst Fauchard with wise hand and pen
For health and beauty of the teeth contends,
Envy's mad tooth is gnashed in vain;
His noble nature treats it with disdain.

It is the pitiful little human touch which shows us that this man, the grateful friend of the famous Carméline, the friend and dentist of many of the members of the College of Surgery and Faculty of Medicine, had among his own *confrères* a few spiteful and envious detractors. This caused Fauchard in his second edition to state that—

The rumor having been falsely set about that he has abandoned the profession, which rumor cannot have been invented otherwise than by those individuals who, sacrificing honor to interest, would attract to themselves the persons who honor the author with their confidence; he therefore finds it necessary to give warning that he still continues the practice of his art in Paris, in the Rue de la Comédie Française, together with his brother-in-law and sole disciple, M. Duchemin.

Or the Latin verses may, perhaps, refer to the bitter controversy that Croissant de Garengéot—a studious, dull man who is remembered for the key he *didn't* invent—carried on against him.

Space will not permit taking up in detail many of the points in his book referred to. Some of them are very curious. Fauchard did not approve of tooth-brushes, and advises the use of small sponges in their stead. He preferred tin to lead for filling teeth, and did not care much for gold. "Besides," says he, "gold being dear, not everyone can, or will, make the corresponding outlay."

Fauchard has much to say of interest in the chapter in which he treats of the

correction of the irregularities of the teeth. He made use of the most simple means, the file, pressure with the fingers, common or silk threads, and little plates of silver and gold. At times for straightening teeth he made use of the pelican and straight forceps, afterward tying the teeth in the normal position. He rarely had recourse to extraction as a means of carrying out dental correction. (Fauchard, vol. ii, p. 87.)

In closing the account of Fauchard the speaker said: "Before leaving this mighty man, I wish to put on record my sincere belief that the day will yet come when some public recognition of the obligation we are under to this great Frenchman will be made, and that a statue of him will be erected in the city of Paris by the grateful contributions of the dentists of America."

After speaking of some of the followers of Fauchard, the history of dentistry in England was taken up. Passing to the first records of the art in our own country, many advertisements of the first practitioners were shown, and the usual account, with portraits, given of Lemaire, Gardette, Flagg, the Greenwoods, Koecker, Hudson, and others. The early history of the profession, the founding of the society, the journal, and the college, was referred to, and a brief account given of Hayden and Harris. Particular mention was made of the many distinguished dentists of the South, and their portraits were shown on the screen.

In closing, the essayist spoke of the History of Dentistry, by Dr. V. Guerini of Naples, which is now in the hands of the committee, as follows:

This wonderful work is ready for immediate publication as soon as seven hundred dentists out of the 30,000 practitioners in this country evince enough interest in the subject to signify their desire to subscribe to it. Your committee has sent out thousands of circulars to the most progressive dentists in the world; the matter has been widely published in the dental journals, in many cases with editorials, and after many months but about 400 subscriptions have been re-

ceived. We require at least 300 more to begin the publication of the book. There is no time to lose; this remarkable record of the early history of the dental art must be presented before the record of American dentistry can be properly considered. Is it too much to ask your earnest co-operation with us in this great work?

Discussion.

Dr. J. Y. CRAWFORD, Nashville, Tenn. It affords me a great deal of pleasure to be called upon to say something in commendation of such an exquisite work, from an historical standpoint, as has been exhibited to us this evening. I would not presume to add anything to the splendid presentation that we have had. It has always afforded me great pleasure to listen to Dr. McManus in the presentation of anything that he has done for dental surgery; and I feel sure that the work he is doing will, one of these days, place his portrait upon the screen to be looked upon by our successors with as much pleasure and pride as we have looked upon the faces that he has exhibited to us tonight. The dental profession is under great obligation to Dr. McManus for this work, for of all the work in the world of a literary character, I have always believed that of the great historian was perhaps submitted to the severest test. All peoples pass upon the merits of the work of the historian—a work that has very much to do with the formation of public sentiment and in placing that estimate upon character that character is entitled to.

I feel that everyone present tonight is giving to this paper that high appreciation which it deserves, and if the spirits of the souls of the departed watch over and take an interest in the affairs of men, what must be the pleasure of those that have been represented upon the screen tonight, when they look down upon this consecrated scene in this southern city, and hear what the essayist has said in honor of their memory! May the essayist continue in his work to create in the hearts of the dental profession of the world a permanent shrine for the mem-

ory of these men who have lived so cleanly, and who have done so much to benefit humanity in the past. May all of this be, to the young men who come after us, an inspiration to still higher attainments in the work of our beloved dental profession.

Dr. BURTON LEE THORPE, St. Louis, Mo. I want to say just a word in appreciation of the immense amount of work done and the time which Dr. McManus has spent in gathering this and other data in his possession. I dare say you all realize that he has shown you on the screen only a few pictures of the many in his collection. He has also told you only a few scattered facts regarding the careers of the men whose faces he has shown tonight. They are the men who have made dentistry, not only in America but throughout the world, and to them, professionally speaking, we owe everything that we have in the way of high standing and character as a liberal and respected profession.

I imagine that none of you can quite realize the immense amount of work, time, and money that Dr. McManus has spent in gathering these data. I have done some work along this line, and I assure you that it is a labor of love, and it is to the credit of Dr. McManus that he is willing to work for the honor and the glory of his profession in giving us something in a permanent shape, which we can record as the absolute authentic history of dentistry. No other profession has so little history to its credit as dentistry. We have been negligent in the past and it is only within recent years that we have been able to obtain these historical data in a permanent form, and therefore I can heartily indorse the recommendation made by Dr. McManus, that this association should take it upon itself to do the right and appropriate thing by subscribing to Dr. Guerini's history of ancient dentistry—a most remarkable work done by a most remarkable man, who has had the energy and enthusiasm to devote his time and labor to the gathering of these data, in order to give us an authentic record of the true status of dentistry in the ancient times.

No one in the world, to my knowledge, is as happily situated as Dr. Guerini for carrying on this work, living as he does in Naples, the fountain-head of historic lore, where he is surrounded by ancient tombs, museums, and libraries, in which he can collect these facts from the molding and decaying records of ancient dentistry. I hope that our members have the love of the profession at heart, so that everyone will contribute five dollars—which is the price of the subscription—toward the publication of this book under the auspices of this association.

Dr. H. L. AMBLER, Cleveland, Ohio. Personally I wish to thank Dr. McManus for presenting this paper, and I think we should all feel that we have learned a great deal this evening, because I know very well there are very few dentists that have ever made any study of the history of the profession. Dr. McManus, and also Dr. Thorpe last year at Buffalo, showed before this association many pictures of pioneer dentists, and told us many interesting things about them, and they should have our thanks, not only for collecting these numerous pictures, but also for gathering the biographical sketches of those whose pictures were exhibited. I have done very little compared to what Drs. Thorpe and McManus have accomplished in this direction, but I can very fully appreciate their work, and can assure you that no one in this room who has not attempted such work can imagine the amount of correspondence, the number of personal interviews, and the traveling expenses involved in it, and for that reason I think these men should have our thanks.

I will simply refer for a moment to one other point of which Dr. McManus spoke, and which was not noticed by any of the other speakers, viz, that every dental college should teach more or less of dental history to its students. I am very fully in accord with that idea, as it is the most appropriate thing in the world to teach students what the pioneers in their profession did. Now, it is plainly evident that it is an easy thing to interest people and to interest students in the study of history. When you can have

a picture placed before them, and a biographical sketch read to them, history becomes the easiest subject in the dental curriculum in which to interest students, and every lecturer upon the subject will tell you the same thing. As you are not students here this evening, I will carry the illustration one step farther, and say that this fact is very well demonstrated here, because the attendance this evening is the largest that we have had at any one of our meetings thus far.

The credit of first introducing the study of dental history into the dental college curriculum is due to a gentleman who is present here tonight. The first man to be appointed a professor of dental history is Dr. Cigrand of Chicago. In or about the year 1892 he began to give a course of lectures to the students at the college with which he is connected, and your speaker is the second one who ever took up the subject and gave a course of lectures in a dental college; this was at the Western Reserve University dental department, and since that time I have kept a record of the dental colleges which have paid more or less attention to this subject, and at present there are nine out of about fifty which are teaching dental history, a fact showing that the subject is gaining a hold not only upon the profession but also upon the students, and through them upon the laity. And what is more appropriate than that the dental student should know something of the history of his profession? What profession can you name that teaches its students nothing concerning its founders and pioneers? You cannot name a single profession—law, art, literature—that does not teach its students something about its history. Now, is it not high time that all the dental colleges should wake up to this fact, and teach their students something of dental history in order to place us on a level with the other professions in that respect? We want to be placed on a higher plane; we want to be on a plane with theology, law, and medicine. If we do, then is not the teaching of history a step in that direction?

Dr. McMANUS (closing the discussion). I just want to say that this work

has not been the labor of any one man, but of a great many, and none have done better work than Dr. Thorpe in publishing in the dental journals the biographies of our early American practitioners.

I was glad that Dr. Ambler spoke of Dr. Cigrand, who is a pioneer in this study; I also think we will all agree that one of the greatest men in connection with historical work in dentistry is Dr. Wm. H. Trueman of Philadelphia. He is the leader of us all, and when we are in doubt and want to know the facts we go to Dr. Trueman. Dr. Kirk, notwithstanding his many other duties, is also very much interested in this work.

In France they have a history of dentistry by Lemerle, and one in Germany by Geist-Jacobi, but there is nothing accessible in English, and that is what we are working for and will have very soon, if the dentists of this country support the effort now being made to publish Guerini's history. I would be ungrateful if I did not express my appreciation of the kind remarks made this evening, even though I cannot quite agree with all of them.

Section II then adjourned until a later session.

SECOND DAY—THURSDAY.

The second meeting of Section II was called to order Thursday, September 20th, at 12.30 P.M., by the vice-chairman, Dr. W. R. Clack, Clear Lake, Iowa.

The first order of business was the reading of a paper by Dr. GEORGE H. WILSON, Cleveland, Ohio, on "Prosthetic Nomenclature."

[This paper is printed in full at page 456 of the present issue of the COSMOS.]

Discussion.

Dr. S. H. GUILFORD, Philadelphia, Pa. I think this organization is to be congratulated on having secured a paper such as the one we have just listened to. I feel sure that it will be considered one of the best papers presented at this meeting. I do not know of anyone better fit-

ted to write upon this subject than Dr. Wilson. As many of you know, Dr. Wilson is not only a student, a teacher and writer, but he is also a worker. I take a very deep interest in this subject and have for many years, and the reason why I do so is because I love my profession and want to see it rise to a higher plane. That can be done in various ways, and certainly this is one of them. We are very fond of speaking of the advancements made in dentistry, and of calling it an art and a science. Now, it is true that dentistry has developed to a great extent, but we cannot claim that it is really a science unless it meet all the requirements of a science. For one thing, those who write or speak on dental subjects should use scientific terms. If you look you will find that throughout the realm of science, in a great majority of cases, and particularly in the more modern sciences, the words and scientific terms used convey a definite idea. That is scientific; it is exact. We have had a gradual evolution in the matter of nomenclature, and we find that in medical science, as well as in our own profession, we have been gradually eliminating those terms which include the names of persons. We have been striking out here and there the name of the individual, and giving to a part the word that indicates what it is.

We used to speak of Riggs' disease, but now it is "pyorrhea alveolaris," which is not a good term for that disease, although it expresses the idea in a way that all understand. We formerly said antrum of Highmore, but now it is the maxillary sinus, a term that expresses exactly the idea of a sinus situated in the maxillary bones. We want to continue advancing in this direction and must therefore eliminate the terms that do not express an idea accurately, and when we coin new terms they should be distinctly definite. The English language is limited in its capacities and resources, and so we are often obliged to borrow from other languages; while on the other hand, other languages return the compliment. The science of electricity has taken nearly all of its terms from the Greek,

and in dentistry we have borrowed many words from both Latin and Greek.

In the matter of improving our nomenclature we have been doing something, but we are moving very slowly. Dr. G. V. Black presented a very valuable paper on this subject before the Columbian Dental Congress in 1893, and afterward committees were appointed by the National Dental Association, in the years 1895-96, to study the subject. Nomenclature was included in one of the sections of the Fourth International Dental Congress, and now we have the subject included in one of the sections of this organization, so that every year something is presented in connection with it. The Institute of Dental Pedagogics, composed entirely of teachers, has taken up the subject, and last winter at the meeting held in New York, a commission was appointed with authority to appoint subcommittees to select proper men that would carry on the work in a systematic way. If the members of the commission can agree upon a definite system of nomenclature, the schools, journals, and writers will adopt it, and in that way it will be spread throughout the realm of dentistry.

It is very unfortunate that we should have to employ so many words that are inaccurately applied. It has annoyed me for many years that dental dealers should speak of tweezers as pliers. The reason given by them for so doing is that the profession has called them pliers, and so they continue to use the term. We are to blame, to a great extent, because we continue to use these terms that we know are incorrect, for we should adopt the proper words in speaking of instruments and in everything, and I hope that eventually many of these incorrect terms will be eliminated.

In the matter of absorption, Dr. Wilson draws a line of distinction between absorption and resorption, and his definition is correct in at least one particular. He says resorption is the removal of waste products, but the alveolus is not a waste product; it is removed because nature has no further use for it; its space is more desirable than its company.

We have a method of soldering which some call autogenous soldering, while others call it sweating. It is not welding, as Dr. Wilson says, because there is no force used in the process, and he prefers the term sweating. Neither sweating nor autogenous soldering express the idea exactly, but I think the latter term is to be preferred. He also objects to the name cap crown when used instead of shell crown. I think shell crown is to be preferred in that case. In regard to the word karat, we find that he prefers spelling it with c, and quotes many authorities who prefer the c to the k. He also gives it spelled with k as a second choice, but I think we should drop that entirely and use only the c, because so many of the authorities prefer it.

With reference to the word carborundum: I was very much surprised to find that it is not to be found in Gould's dictionary.

Over the terms "cast" and "model" I have struggled for many years. Dr. Grant Molyneux tried to convert me to the views Dr. Wilson holds with regard to the significance of the two terms, but while he did not succeed then, I think Dr. Wilson has converted me now. I believe *cast* should be used in reference to vulcanite work, and *model* when a thing is to be reproduced in metal. It seems a good distinction to make in the use of these terms.

Speaking of the word collar crown, he suggests that term as an improvement upon the Richmond. It has always been a question as to whether Richmond should have the credit for that crown, and I think the preponderance of evidence is that he did not originate it, and I believe collar crown is to be preferred, because it embraces all the features of that crown. Under the head of crowns, he says that there are two kinds, one attached to the root by means of fixed dowels, and the other by means of detached dowels. There is another class of crowns requiring no dowels at all. We often insert them on anterior teeth that are greatly worn down.

I do not think we ought to change the spelling of words arbitrarily, but the

word gauge, in my opinion, should be spelled gage.

In regard to impression cup and tray, we have been in the habit of using the term impression cup, but, as Dr. Wilson says, cup conveys the idea of capacity, while tray implies that which holds and carries; therefore we should use impression tray rather than impression cup.

As to the lingual surface of the teeth, the essayist says that the term palatine should not be used, but prefers lingual, because the inner surfaces of the teeth of both upper and lower dentures are next to the tongue.

We formerly spoke of the superior and inferior teeth, but the terms are not distinctive enough. Superior and inferior refer to quality as much as to position, so we should adopt the terms upper and lower instead. Upper and lower possibly do not sound as elegant, but they are quite proper. The medical profession use superior and inferior, and we copied their words.

I like Dr. Wilson's criticism of the word *prosthodontia*, that was introduced some years ago by one of our dental editors. It was suggested that as *orthodontia* was a good word for the correcting of deformities of the mouth and face, *prosthodontia* would be a good word for prosthetic dentistry, but when we consider the Greek roots from which the word is derived, it will be seen that it is not a correct word. It does not fully express the idea, and while it seems to be in line with *orthodontia*, it does not express as much as do the terms *prosthesis*, or *prosthetic dentistry*.

In regard to another point: When we make a bridge we usually have two abutments or piers, and between these piers we place crowns that we call dummies. That term has come into use because they were so called in the early days for lack of a better word. As yet we have no better word to express that idea, and Dr. Wilson suggests the word *substitute*. That is not good, because it is not sufficiently definite. I do not think that we should abandon the old word until we find one that expresses the idea accu-

ately. The great point in nomenclature is to adopt words having definite and explicit meaning.

Dr. J. H. Crossland, Montgomery, Ala. I wish to add only a few words. I notice that the essayist prefers the use of the word *absorption* as applied to the taking up of nourishment, and *resorption* to the taking up of waste products, etc. There is a good reason for this distinction. If we go still deeper than he has gone into the study of the etymology of these words, we find that the word *absorb* comes from *ab*, away, and *sorbere*, to suck, which in its strict sense means to take up or away. *Resorb* rather means to suck up again, that is, to take back something. The word becomes more forceful and I think the distinction decidedly correct and happily made.

Truly the student of etymology finds that the dead languages do not change, but our knowledge of subjects changes. I have thought of two or three words during the course of the discussion that come under this head. For instance, the word *electron*, which means amber. In olden times the Greeks knew that if they rubbed amber the friction would produce a force which would attract particles of other substances, and the evolution of nomenclature has brought us the term *electricity*, which conveys no suggestion of amber save to the student of etymology.

If we go outside of the technical terms we find the same condition of things. For instance, the word *dilapidated* comes from *di*, apart, and *lapis*, a stone. In its original significance it meant a condition of a structure built of stones in which the stones were falling apart, hence could not properly be applied to any but a stone structure; but now time and custom have changed that, and we may correctly say that a wooden building is in a state of *dilapidation*. I mention these instances simply to show that nomenclature is frequently a compromise. We cannot always find words to express the exact meaning we intend to convey, because in a great many cases we do not understand the subject thoroughly. We may express what a subject

means now, and next year it may mean something else.

I am in favor of classical derivatives in all cases where they can be reasonably retained or introduced. They add to the strength and dignity of language; conduce to order in science; illuminate the path of research, and inspire the student to basic culture. I do not think it well to change a word unless there is a very good reason therefor.

With regard to the derivation of karat, there is another derivation that the essayist might have mentioned. Way back in early Egyptian times karat meant a grain of wheat which was used in weighing precious metals, etc., and they spelled it with a k or a similar letter, and that is the reason we use k instead of c.

With regard to the term pyorrhea alveolaris, just as Dr. Guilford says, it does not express the whole idea, but it probably comes as near to it as any descriptive derivative—if I may use such a term. But sentiment, and only sentiment, would entitle Dr. Riggs' memory to perpetuation in connection with it.

Dr. JAMES McMANUS, Hartford, Conn. In discussing the subject Dr. Guilford speaks of Dr. G. V. Black as one of the first who wrote on this subject. I think we can go farther back still—to the writings of Drs. Atkinson and Corydon Palmer. It has been a matter of surprise to me that my friend Dr. Guilford, in the many years that he has been interested in this subject, has not taken a more active stand in forcing his scientific ideas on the profession through the medium of the association. If he wished to do here what should have been done in the National Association of Dental Faculties, he would insist upon a committee being appointed, consisting of representatives from each college, for the purpose of devising a system of dental nomenclature, to be published in book form under the auspices of the association, and later on adopted by teachers. These little books on nomenclature could be given to each student, who would be guided thereby in his selection of terms. I am glad to hear Dr. Guilford say that there has been some little move made in

this direction, but it is likely that it will be as slow as it has been in the years past, unless we work systematically and earnestly, and the only practical way that I can see is to have these little pamphlets or books published. After they have been in use for one or two years, the publishers of dictionaries will be glad to incorporate their contents in their new editions. If we can secure proper support it will take but a short time to select the proper terms and to place them in the hands of the students.

Dr. GUILFORD. That is what I have done. At the last meeting of the Institute of Dental Pedagogics, which is composed entirely of teachers, there was a paper presented on the subject we have been discussing. The suggestion was made and adopted to select the proper men to go over one or two subjects each year, and to refer their report to a committee to criticize and improve it if possible. The report with correction would then be presented to the association, which after passing on the report finally, would send a list of accepted words to the journals and colleges. The next year two, three, or more subjects would be taken up, and so on, until all the subjects of dentistry would be covered.

The next order of business was the reading of a paper by Dr. J. H. Crossland, Montgomery, Ala., on "Prophylaxis a Factor in Dental Education," as follows:

PROPHYLAXIS A FACTOR IN DENTAL EDUCATION.

Webster's International Dictionary defines prophylaxis as "the art of preserving from or preventing disease," etc.

The exponents of what some see fit to denominate "the new departure," with seemingly perfect unanimity, recognize the necessity of frequency and periodicity in the application of this art to the treatment of the human mouth. In the client who returns with punctilious periodicity for examination and advice, and such services as may be necessary, and who is intelligent and tireless in his efforts to obey instructions, we find one extreme;

at the other is the patient who comes to us only to seek relief from pain. Probably no practice is without these extremes or any of the degrees between them. At the latter extreme, and the degrees between it and the first mentioned, we have a class of *clientèle* whose enlightenment is one of the great problems of the dental education of the period. "Doctor" in its primal significance meant teacher, but it does not now bear that significance. This applies, especially, but not exclusively, to the lay mind.

Daniel Webster believed that inspiration or preparation was absolutely essential to a consummate utterance. Indeed the solution of the aforesaid problem will require both preparation and inspiration—inspiration on the part of the patient, and preparation and inspiration on the part of the practitioner. The heart of the teacher must throb in unison with the import of the words he utters and the lessons he would teach. The most eloquent words the human tongue may speak are useless if the soul of the speaker is not attuned to the spirit of his theme.

Mechanical, surgical, and therapeutic procedures in their varied forms and many aspects have brought degrees of relief from those ills with which civilization and lack of function have afflicted the oral cavity.

Our art has struggled forward, buoyed and led by untiring genius, its meandering course bringing it at times within the rays of that great beacon of human progress—the light of science. And thus has its partial attainment of its destiny as a specialty in the great economy of human effort brought to the zealous and worthy of its votaries that *sine qua non* of all human advancement—inspiration to further progress and higher attainment. Perfect consummation of even our dominant theories and hypotheses of former years could have resulted in only an approach to such conditions as nature designed. But the object of the prophylactic treatment of today is far above and beyond this—the maintenance of natural conditions—and the ideal of today, in the eternal fitness of

things, is higher and grander than any other period of our development has ever known.

A woman's neglected mouth—an accumulation of calculi and débris in wild profusion, teeth opaque and lusterless, gums all bleeding and sore—a foul, filthy, repulsive, and dangerous mouth—an approach to a disease, loathsome, horrible, maybe incurable—prince of oral diseases; cheeks sunken and innocent of color, eyes lusterless, languid, and wan; and through this mouth passes nourishment for this mother and her child!

A few months of the application of prophylactic treatment with unflagging energy, punctilious periodicity, and strict obedience to instructions, and behold the changing picture! Gums are coral now, and the stiffest bristles reddened not upon them more. To the teeth the mingled gleam of ivory and luster of pearl is returning, and translucency in its vital glow and splendor; back to the rounding cheek the rose tint is creeping, and the fire of life and aim again is kindling in the twinkling eye. A troop of young hopefuls are filling appointments with a punctuality which betrays maternal inspiration. Verily, the heart that throbs not with professional pride in the presence of such a picture must be immune alike to the beauties of esthetics and the grandeur and glory of the high and holy spirit of ethics!

The proceedings of our meetings and the pages of our journals teem with theories and hypotheses as to means of enlightening the masses regarding the necessity of dental services and advice; and pages and pages of logic and eloquence have been expended on this topic with seemingly no adequate results.

In the so-called "new departure" which is constructively such, a most splendid opportunity is presented for the dissemination of such enlightenment. Were schoolboys taught one day of every month, and allowed to devote all the other days to play, how much of their curricula would they assimilate? How much of our instruction does the average patient assimilate sufficiently consummately for guidance during the long, per-

haps yearly, intervals between visits to us? How different is this assimilation by those clients who make monthly visits for hygienic care? Read the answer where minute stoppings forestall caries' ravaging blight; where, in prodigal profusion of curved lines, coral gums embrace, in matchless symmetry, graceful forms of dainty ivory, and immaculate surfaces of gleaming pearls charm the vision of those whose souls are congenial with the good, the true, and the beautiful! There is an inexpressible sense of cleanness which delights the refined, and the cultured client enthuses over the lustrous vitality, comprehending the significance of periodic supplementation of function effected in accordance with the mandates of that mysterious force which imparts rhythm to the movements of the universe.

In short, and in conclusion, constant observation of pathological conditions, and systematic and inspired effort to reach the ideal—the physiological—will, in the natural course of things, furnish incentive to deeper and more thorough study and research into these important and basic subjects. The closer relation and better understanding between practitioner and client, which will come to them, will redound to the great good of the latter and to dentistry, as well as to the worthy practitioner. The public is gradually, if slowly, coming to realize that a dentist should be something more than a mere mechanic; that, forsooth, intelligence, culture, and refinement are necessary to his symmetrical professionalism. This has been learned by some even from the irregular contact with him which has so long and so generally prevailed. The frequent and regular intercourse between him and his client is replete with opportunities for the observation of the degrees in which he has attained to these requisites; and its effect as to the enlightenment of the lay mind is destined to become a mighty factor through that beautiful law of compensation which finds expression in the survival of the fittest.

The chairman announced as the next order of business the reading of a paper

by Dr. H. HERBERT JOHNSON, Macon, Ga., "A Review of the Methods Employed for the Retention of Fillings."

[This paper was printed in full at page 362 of the April issue of the DENTAL COSMOS.]

Dr. N. C. LEONARD, Nashville, Tenn., then read a paper entitled, "'Pressure Anesthesia' and the Removal of Living Pulp," as follows:

"PRESSURE ANESTHESIA" AND THE REMOVAL OF LIVING PULPS.

No development in dental science during the past twenty years deserves a more prominent place in the esteem of our profession or a more conspicuous place in its literature than the procedure known as "pulp extirpation under pressure anesthesia," for perhaps no other method introduced during recent years has been of more real value to the intelligent operator, or of more comfort and benefit to his patients.

At the time of its introduction, more than ten years ago, dentistry must have felt the need for a more satisfactory and scientific method of pulp-removal; yet its slow adoption and the half-hearted manner in which it is employed today would still indicate an uncertain or distrustful attitude, wholly inconsistent with progressiveness in modern surgical procedures.

The use of devitalizing agents had for many years proved a more or less satisfactory treatment in cases demanding pulp-removal; and the ease of such applications must have exaggerated the seeming difficulties of the new method, without suggesting its advantages to the operator who is content to follow the course of least resistance, and drift with the tide. But without going very deep into speculation as to reasons for the lukewarm reception to so valuable and scientific a method, I will broadly charge the delay to those faithful adherents who have failed to supply dental literature with suitable testimonials, and will proceed with an endeavor to meet my own delinquency.

With the hope of adding a little more weight to the arguments I shall use in my discussion of the subject, I will begin by stating that for the past ten years I have used this method exclusively in my practice, treating, certainly, more than a thousand cases without, to my knowledge, having had a single case to end in abscess or pericemental infection. A very few cases of partial failure could be readily traced to faulty manipulation, and they only serve to improve my technique and increase my faith. Such a clinical result as this could hardly be accidental, nor could the success be due to the selection of favorable cases, since this report includes all cases which demanded pulp-removal as they presented—with a very few exceptions which I shall mention later—and embraces a very large percentage of cases where the exposures were most difficult of access, and in patients of all ages and variety of temperament.

Theoretically the method seems to approach perfection; clinically its possibilities should only be limited by the intelligence with which it is applied and the dexterity of the operator.

In the light of modern surgery it must be admitted that in a surgical operation where living tissue is involved, the only assurance of ideal results is a clean field of operation and sterile instruments, followed by a non-irritating and antiseptic dressing.

With the aid of pressure anesthesia the removal of the living tooth-pulp becomes a simple surgical procedure, to which all the principles of modern surgery apply; and it must be admitted, again, that an ideal result must be obtained where a live tooth-pulp is aseptically excised at the apical end of the root, and the removal is followed by an antiseptic dressing to the remaining stump, and complete filling of the root-canals.

The only question that admits of argument is whether or not this can be accomplished in a sufficiently large percentage of cases to justify us in adopting it as a routine method of treatment in all cases demanding pulp-removal.

My own clinical experience is to me the best argument; and while I do not

claim, nor believe, that in my practice there has not been a very considerable percentage in which the ideal conditions suggested above have not been accomplished, my uniformly successful results would indicate that we may safely allow ourselves some latitude in deviating from the ideal, provided our technique includes a remedy for the imperfections. Certainly, I would not attempt to claim, nor do I believe it possible to accomplish, the excision of the pulp just at the ideal point—the apex of the root—and its removal perfectly in every case; neither do I believe it possible to have always a sterile field through which to operate; so I prefer to treat the subject from a practical standpoint rather than from that of the idealist.

To recite briefly the technique the results of which I have found so satisfactory, will perhaps enable me to better present my reasons for deviating from what would appear to be the accepted teachings of authorities who have written most plausibly on the subject, and whose teachings I believe to be in some important respects unscientific and misleading.

The term pressure anesthesia as used in this paper is not meant to include the operation of forcing an anesthetic agent through the structure of the dentin by means of a special instrument, but only the simple form used for anesthetizing exposed pulps. The method is very simple, and may be easily and successfully used in any cavity where an exposure may occur, from the third molar forward.

After excavating the cavity slightly by breaking down all frail enamel edges, and removing such loosened material as would interfere with an actual exposure of the pulp, the cavity should be thoroughly washed with warm water. If the location of the cavity permit it, the rubber dam should be adjusted, though if the operator be careful this is not essential to success. After cleansing the cavity as suggested, being sure that an actual exposure exists, I usually apply a pellet of cotton saturated with an agent that is both disinfectant and analgesic, allowing it to remain for two or three minutes. For this purpose I prefer to use carbolic

acid, on account of its sterilizing and anesthetic effects, and also because it prepares the pulp-membrane, by virtue of the escharotic action of the acid, for more ready entrance of the cocain.

By the use of soft yellow wax, pressed into place with slightly moistened pellets of cotton held in a pair of pliers, the most awkwardly shaped cavity can be made into a very simple one for the application of the cocain—barricading, for instance, the interdental space by building in the soft wax, and converting a difficult approximal cavity on the distal surface of a molar into a simple funnel-shaped cavity with the pulp-exposure at the apex of the funnel.

I use powdered cocain moistened with enough adrenalin solution to make it into a paste that can easily be transferred on the point of an instrument to the point of exposure, applying, perhaps, on an average, about one-quarter of a grain of cocain. This pasty mixture becomes more fluid upon contact with the pulp, partly by the exudates from the pulp and partly, perhaps, on account of the warmth of the tooth. By allowing this agent to remain in contact with the pulp for one or two minutes, the membrane of the pulp is generally sufficiently anesthetized by osmotic action to render the remaining part of the anesthetizing operation almost entirely painless.

A pellet of wax is then placed in the cavity in such a way as to confine the fluid cocain against the pulp, and at the same time to exclude as nearly as possible any bubbles of air that might displace the fluid. Then by slight pressure on the wax, either with the finger or a pellet of cotton held in the pliers, the pulp is instantly anesthetized, and may be immediately removed.

After removing the wax from the cavity at the point of exposure, I flood the cavity with a good antiseptic, usually one of the essential oils; then with a sterilized bur held in the engine handpiece I extend the cavity, if necessary, to allow for a ready entrance to the root-canals, in order to bur out the bulbous portion of the pulp. After removing the debris, and again flooding the cavity with an

antiseptic, I proceed with barbed canal broaches—which have been previously sterilized—to remove the pulp from the root-canals. This is usually, except in single-rooted teeth, the most difficult part of the operation, and being of much importance should be done at the expense of time rather than at that of thoroughness. If the anesthesia be not complete, it may be supplemented at any time by additional applications in the same manner as at first.

If the pulp has been removed from one canal, and in others is found to have partially regained its sensitivity, the first canal should be carefully filled, and then the anesthetic agent be reapplied to the others, until each filament, so far as is practicable, has been removed. Broad, flat canals, or those that are very small or much constricted at the entrance, together with anomalously shaped teeth, often constitute complications that tax our ingenuity and modify our success.

But these are difficulties that must be met with in any method for the removal of the pulp. In the light of my own experience and observation, it is obvious to me that if some of the contents of the canals cannot be removed, it is much safer to render such fragments of pulp tissues sterile at the proper time rather than to have to treat a septic condition later on. Many of the difficulties of extirpation are minimized by experience, but it is safe to say that no operator, however skilful, can in every case remove all the pulp tissue.

However, thorough and complete extirpation is not in itself a guarantee of successful results. As in other surgical operations, the most important factor is asepsis, and at every step, from beginning to end, aseptic precautions should be observed in pulp-removal.

While I advocate all reasonable aseptic precautions during the operation, I am much inclined to allow my clinical experience to lead me to the belief that the danger of pericemental infection from this operation has been somewhat exaggerated by some writers.

When we speak of an aseptic operation the term is used only relatively, since we

know that no surgical operation is absolutely aseptically performed. It is even admitted by the most eminent surgical authorities that no operation is ever free from pyogenic and other inflammatory infections. We know, however, that normal tissue will tolerate a certain amount of infection, and while this fact should not influence us in our efforts to secure asepsis, it will help us in a measure to account for our good results!

The presence of an ulcer on the surface of the pulp should not be a reason for the postponement of the operation of extirpation under pressure anesthesia. The facility with which we are able to apply readily such strong disinfecting agents as carbolic acid, creasote, etc., will enable us to so nearly sterilize the septic area as to make the progress of the operation practically safe.

The surgeon who removes a septic appendix, ligating the base and cauterizing the stump with carbolic acid, gets as good results as the one who carefully everts the stump in order to throw all the originally infected area outside the peritoneal cavity. Certainly the peritoneum is more sensitive to infection than the tissue with which we have to deal.

Admitting that a very small amount of septic matter remains on the surface of the pulp, this would not seem to me to be a serious menace to the pericemental tissues, when we consider that it would have to filter through the entire length of the pulp, and that the tissues liable to infection from this source are to be immediately removed under surgical precautions that would inhibit the further distribution of these toxic agents.

When the pulp has been removed my invariable rule is immediate filling of the canals, and this I consider the greatest safeguard against pericemental infection. If all reasonable aseptic precautions have been observed in removing the pulp, I cannot believe that there could be a more favorable time for filling the canals than immediately after the extirpation, while we have the greatest possible assurance that they are sterile. To delay this part of the operation for a subsequent sitting would be but to double or treble the

chances of infection, without offering any compensating advantage, and would deprive us of the use of the best means at our disposal to combat and render innocuous any septic or infectious material that may have been introduced into the canals during the operation.

Certainly no progressive surgeon, after performing an aseptic operation for appendicitis, could be excused for leaving the wound open for subsequent examination to see if everything is all right. He removes the appendix, ligates the stump, manipulates the tissues as little as possible, and closes the wound permanently with an aseptic dressing, which he does not expect to remove until the wound has healed.

The proper filling of the root-canals after the extirpation of the pulp is simply the application of a suitable and permanent surgical dressing for the protection of the living tissue at the end of the root, and is efficient in proportion as the filling is aseptic, antiseptic, non-irritating, and stable.

As a result of extirpation of the pulp there is often considerable and persistent hemorrhage, and the presence of this condition is urged by our authorities as a positive indication against immediate root-filling. To me, their reasoning appears illogical and their position indefensible. The very best device possible for controlling hemorrhage is mechanical means, and I can see no reasonable objection to the immediate introduction of a permanent root-filling for this purpose. Assuming that the operation so far has been done with due regard to cleanliness and asepsis, there should be nothing to fear if we stop the flow of blood with an antiseptic and non-irritating dressing placed in contact with the bleeding stump.

The blood itself is sterile, and if we observe the same precautions in the preparation and introduction of the filling materials as were observed during the extirpation of the organ, there could certainly be no more reason to fear infection than if the hemorrhage had not occurred. If there be danger from a clot in the apical region, then there would be less dan-

ger with the root filled, for the reason that there would be less space for a clot, and the chief avenue of infection would be shut off by the filling.

I cannot conceive of a surgical operation of any kind being completed without leaving a certain amount of free blood to coagulate in the wound; but in the case just mentioned the amount of free blood left would be inconsiderable and insignificant as compared with that left by the most careful operator in an abdominal section, where the wound is immediately closed and permanently sealed with the assurance—in non-septic cases—that if no infectious material has been introduced by the operator, the small clots will not affect his results.

If persistent hemorrhage through the canal after extirpation should deter the operator from performing the immediate-filling operation, the clot that would surely be present at a subsequent sitting would be a much more serious menace to a successful result, in my opinion, than the presence of a coagulum in the first instance. With the root-canals properly filled, the chances of a secondary hemorrhage, against which we have been repeatedly warned, do not seem to me to deserve serious consideration.

As a root-filling material for this class of cases, that which I have adopted—and which seems to meet the requirements—is a paste made by mixing two parts of a coarse cement powder and one part of aristol with oil of cinnamon or any other essential oil or antiseptic agent. This can be introduced with smooth broaches into the bleeding canal, thus partially filling it. Then, with pellets of cotton held in the pliers, the paste may be forced into the canal as the blood is forced out, and packed as hard as may be desired. The cotton pellets, besides forcing the paste into the canals, absorb the blood and excess of fluid from the paste.

If there be any reason to believe that any considerable quantity of free blood has been confined in the apical region beyond the paste, it may be allowed to escape by passing a small, smooth broach through the paste to the end of the canal,

subsequently closing the opening with a sterilized gutta-percha canal-point. I use this paste as a permanent dressing in all canals where I have practiced extirpation, generally supplementing it with a gutta-percha point, and packing the paste with cotton pellets, using always considerable force to make it as dense as possible, and at the same time to force it into all irregularities of the canal.

I do not urge this as the only or the best method of filling root-canals in this class of cases. As it has proved itself satisfactory in my hands, and as it seems to be non-irritating, permanently antiseptic, and is easily adapted to all cases, it may appeal to others.

Among the cases I have treated by this method there have been many in which I was unable to remove all pulp tissue from every canal. From many canals in the buccal roots of upper molars and the mesial root of lower ones, too small to admit of entrance with any ordinary nerve-broach or so constricted as to admit the broach to only one-third or one-half their length, I have found it impossible to remove all the contents. In these cases, if I cannot remove the pulp, I always leave it in. This is at least the philosophic thing to do, and I do not worry over any possible failure. I do not in such cases hesitate to introduce immediately a permanent filling.

After filling the other canals in the usual way, I flood the whole cavity with the antiseptic that was used in making the paste for the root-dressing, working it with the smallest nerve broach as far in beyond the remaining stump as possible, then applying the paste directly against the bleeding stump, and with pellets of cotton held in the pliers, packing the paste firmly, using a considerable amount of force, in the hope, at least, of injecting the canal or the pulp-filament with the antiseptic.

This will no doubt be criticized as being unscientific. Perhaps it is. I should like, myself, to have a method more in accord with accepted scientific theory. I shall not attempt to defend it as scientific, but will report only my results. So far as I know, I have never had

a case of this kind to end in abscess formation. A small percentage have manifested slight temporary soreness, but the percentage has not been larger than in cases where I had reason to believe all the pulp tissue had been removed. A striking fact is that none have shown neuralgic symptoms. In the majority of cases where slight tenderness or soreness has been present, I have generally attributed this symptom to traumatism, sometimes to mechanical irritation of the root-filling, or to incorporated air. But very few of the cases have had recurrence of this symptom.

My success with the method I have attempted to discuss I do not attribute to any unusual degree of skill on my part, but to the correctness of the principles on which the method is founded—true surgical principles.

The knowledge that many of my operations have been very imperfectly done without seriously affecting the results has added largely to my faith that it is the true method, and that it will ultimately prevail against the use of devitalizing agents. As stated before, I have found it applicable to nearly all cases requiring the removal of living pulps. The cases of which I have made exceptions would not amount to more than two per cent., and include but two or three cases in which the pulp tissue seemed to possess an idiosyncrasy against cocain anesthesia, and even in these I have suspected some faulty manipulation in applying the anesthetic.

In another small percentage of negative results I have found the cause to have been a partially devitalized condition of the pulp, the dead portion barricading the way by its valve-like action, and preventing the ingress of the anesthetic.

These, with a few cases of timid patients, constitute all those in which I have been unable to utilize the method under discussion.

Pulp-stones have often been difficult complications, but I do not now remember a case of this kind in which I have been forced to resort to a devitalizing agent.

Discussion.

Dr. W. H. LEAK, Watertown, N. Y. The paper we have just heard shows the care the essayist has used in its preparation, and the thoroughness with which he performs the operations he has described, a factor which in a great measure accounts for the success he has had in such a large number of cases. He alludes to the very small percentage of cases in which he has not been able to obtain anesthesia by the pressure method, owing to the presence of a slightly disorganized pulp, and I note that in such cases he uses carbolic acid prior to the application of cocain. I am unable to understand why he uses carbolic acid, which we know is a strong coagulant that would render the pulp more difficult to anesthetize.

With regard to the thought that he brought out in connection with the filling of the root-canals after extirpation of the pulp: I have wondered if I misunderstood him in thinking that he said that he filled the canals even in the presence of a slight blood exudate, and that no trouble ensued, either in the form of an abscess or of pericemental infection. It seems to me that it would be best to wait until the flow of blood has ceased before filling the canals.

I had one peculiar case in connection with the extirpation of pulps with cocain that I would like to relate, and to ask whether any others have had a similar experience. It was the case of a strong, healthy woman, about forty years of age, in whom I used a solution of cocain and adrenalin. After pressure on the pulp had been exerted for a minute or a minute and a half, the patient raised her hand in an endeavor to stop the operation, and I removed the rubber dam after inserting a small pellet of cotton into the cavity. The patient then told me that she was feeling very faint, and complained of an oppressive burning sensation that lasted for a few minutes, after which she recovered completely.

Dr. J. H. CROSSLAND, Montgomery, Ala. I am not opposing any of the views expressed by the essayist, but if there is

anything which has been impressed upon me by considerable clinical experience, it is that there should be a period of rest and drainage after the extirpation of the pulp, before the canals are filled. If they be filled immediately after extirpation there is a greatly increased danger of discoloration of the tooth. We may easily talk of the scientific methods of removing the contents of the tubuli, but when we fill these teeth immediately a large percentage of them will discolor and break down, and the red blood corpuscle will get in its work.

In regard to the application of cocain in powder form: After the pulp is exposed and the cavity dried, a piece of the pellet is placed in contact with the pulp, and when the cocain has become moist by the exudation from the tissues, pressure is applied, and anesthesia usually results.

I did not understand the essayist's remarks with regard to mummification. I thought that it was a thing of the past; that progressive dentists did not attempt to mummify a pulp, except in cases where it was found impossible to remove it entirely.

Dr. CHARLES McMANUS. I would like to offer a suggestion as to the first two words in the title of the paper, and that is the expression "pressure anesthesia." We have just had a paper on nomenclature, and it occurs to me that pressure anesthesia is not a good name for that procedure, although it is the term in general use. I do not know that I can present a better one, but it seems to me that there should be some exact term applied to the very important operation of cocain pressure anesthesia.

I have enjoyed hearing this very instructive paper by Dr. Leonard, and am particularly pleased with the way in which he has presented the subject. The results he has obtained are most satisfactory and encouraging, and the essay itself is a model, as a short, clean-cut, scientific paper.

Dr. W. D. MONROE, Washington, D. C. I think if the essayist will use adrenalin in connection with the cocain, it will do away with the hemorrhage in nearly every case. The cocain and adrenalin

can be obtained in tablet form from any druggist, and is very convenient to use.

Dr. LEONARD (closing the discussion). I would like to thank those who have taken part in the discussion for the interest manifested in the subject, and for the compliments paid my paper. I trust that I have shown what I endeavored to show—a scientific spirit in the investigation of this subject. I tried not to be dogmatic in any of the statements made, and I certainly hold myself ready to receive any suggestion that may be an improvement on the technique that I have suggested, or in the treatment of these cases.

I will just refer to some of the points mentioned by those who have discussed the subject. Dr. Leak spoke of the use of carbolic acid previous to the application of the cocain. My reason for it is threefold: In the first place, carbolic acid being a powerful sterilizing agent will, to a degree, destroy any septic matter that may be present at the exposure. Sometimes there is a little pus present, and by such means I endeavor to destroy any material that may be the cause of it. I also use it on account of its analgesic and anesthetic effects, as I think that the carbolic acid renders more favorable the entrance of the cocain into the tissues, and while I do not wish to make a positive statement about this point, yet I feel that in many cases the anesthesia is produced more quickly where the carbolic acid is used than where it is not, and that perhaps the coagulum formed on the pulp tissue is more favorable to the osmotic action that carries the cocain into the pulp.

The case reported by Dr. Leak I consider a coincidence; the same symptoms would probably have been noticed had no toxic agent been used at all. I frequently have had cases in which although no agent whatever had been employed, symptoms occurred that I would probably have attributed to cocain if I had used it. I have very seldom seen any constitutional effects following the use of cocain by the method I have described. I can recall but one case where I was sure at the time the cocain had caused the toxic effects, and I suspected then that

some of the fluid had leaked through, and been swallowed by the patient.

As to drainage I can say that it is not necessary, if we have been careful in our antiseptic measures during the removal of the pulp. If we have been careful we will have as nearly as possible a sterile field. Why not apply a surgical dressing, just as the surgeon does in the case of major operations? After he operates he places a dressing to protect the tissues that have been wounded, and leaves it in place expecting that it will keep the tissues aseptic until the wound has entirely healed. It is simply a surgical procedure, and I think we are thoroughly warranted in using the same methods in dental surgery, where we have reason to believe that the operations have been done aseptically, as are used in surgical major operations. As far as drainage is concerned we get better results without drainage, by lessening the chances of infection, as surgeons do in abdominal operations performed under aseptic precautions.

As to mummifying: I did not use the term mummifying at all, because I did not want to be regarded as an advocate of mummifying pastes, etc. The only reference I have made to this paste is where I have used it as a dressing simply, in cases where I could not remove the pulp tissue, where the canals were too small or tortuous, or where there was some physical reason why the pulp tissue could not be removed. In no cases do I

leave the pulp tissue in the root-canals, except when it is absolutely impossible to remove it. But in those cases where I have used this paste as a dressing to remaining stumps that I have been unable to remove, my results have been satisfactory, for at least I have never had to contend with abscesses, or other serious after-results.

I agree with Dr. McManus that pressure anesthesia is not a suitable term to designate these operations. I used the term in quotation marks, simply to indicate that this was the operation known as pressure anesthesia, and I said that the term as used in the paper was not meant to include the procedure in which special instruments were required to force the agent into the structure of the tooth.

As to the use of adrenalin, perhaps Dr. Monroe did not notice that I said in my paper that I used adrenalin in connection with cocain. I do not know that it offers any special advantage, unless it be that the anesthesia is thereby more easily induced. I began the use of adrenalin in hope that it would inhibit hemorrhage, but so far it has been my experience that it does not lessen it very materially.

Dr. J. P. CORLEY, Greensboro, Ala. I would suggest as a more nearly proper designation for the description of the operation described by Dr. Leonard, the term "pressure cocainization."

There being no further business before Section II, motion was made and carried to adjourn *sine die*.

The Clinics.

Dr. J. A. GORMAN, Asheville, N. C. "Orthodontia."

Dr. Gorman exhibited a large number of casts showing malocclusion of the teeth, and the conditions after treatment.

The clinician laid special stress on—

- (1) The importance of studying first of all the occlusion of the molar teeth.
- (2) The importance of beginning the treatment as soon as possible after the

eruption of the first molars, and of getting these teeth in their proper positions. (3) The simplicity of the appliances used. Only Angle's "D" bands and expansion arch and the Baker anchorage were used for correcting the malocclusion.

Dr. I. N. CARR, Durham, N. C. "Combination Filling of Tin and Gold."

Dr. Carr demonstrated the properties of Ambler's cohesive tin, filling a large compound cavity in a lower molar by building the filling with successive layers of tin and gold. He then removed the filling and cut into it to show the cohesive property of the tin. He also filled a large approximal cavity with Ivory's "crystallia," a shredded tin, restoring the contour by building with the tin on cohesive gold. A cross section of the filling showed that the union was perfect.

Dr. W. H. CUDWORTH, Milwaukee, Wis. "Porcelain Inlay Restoration of a Central Incisor."

In making this restoration the clinician used Jenkins' porcelain, a platinum matrix, and an electric furnace. He obtained good contour, sharp corners, and fine color. Ames' special inlay cement was used for setting the inlay.

Dr. J. A. HALL, Collinsville, Ala. "A Temporary Lower Denture."

With a gutta-percha base and a cement body a temporary lower set can be easily constructed, and the denture worn immediately after the extraction of the teeth. It will protect the wounded tissues and aid in mastication. It will also sustain the lips in a normal position—thus retaining the original facial contour—and will aid in enunciation. Gutta-percha can be extended lower down on the ridge than any metallic or rigid plate, without lacerating the tissues with which it may come in contact. Gutta-percha is not, strictly speaking, an irritant, and is decidedly more cleanly than rubber. It also clings to the ridge with greater tenacity than a rigid plate, and the muscles and soft tissues will tolerate its presence without becoming inflamed.

In cases where necrosis or other causes have destroyed a large area of bone, leaving flexible tissue interwoven with muscular fibers which almost float in any direction, a base of gutta-percha is most certainly indicated.

Dr. E. P. DAMERON, St. Louis, Mo. "The Use of Interchangeable Facings."

The clinician showed an upper anterior bridge of six teeth made with in-

terchangeable facings. The abutments were Richmond crowns, reinforced by having the band of the crown extend down over the gingival margin of the facing, concealing the joint and increasing its strength. He also showed a porcelain-face bicuspid shell crown, using interchangeable facings. The shell crown is first constructed, the buccal surface cut away, and the backing of the facing soldered to the shell. The facing is then cemented to place. The same arrangement for the band at the gingival margin is followed as in constructing the Richmond crown described above.

Dr. C. H. FRINK, Fernadina, Fla. "Porcelain Restoration of Malformed and Diminutive Laterals."

The tooth is prepared with a shoulder at the lingual aspect of the gum margin, sloping the surface at the labial aspect of the gum margin. A shell matrix is formed of platinum, after which a plain vulcanite tooth is approximately ground to fit by cutting out the pins and otherwise concaving the posterior surface. This porcelain shell is held in position with a small lump of hard wax, just warm enough to hold the matrix to the tooth-shell while removing it from the mouth. The matrix and tooth being held in a pair of locking tweezers, the wax is carefully removed, and the high-fusing body applied. After the baking is completed, the matrix is removed, and the inner surface etched with hydrofluoric acid and cemented in position.

This clinic was illustrated with a large plaster cast of an upper left lateral incisor of diminutive size.

Dr. F. E. ROACH, Chicago, Ill. "Moldable Porcelain, Showing its Uses and Manipulation."

The principal field of application for this material is as a substitute for amalgam, in large restorations of molars and bicuspid, and especially in cases where, until the present time, gold crowns have been almost universally used; and also for perfecting the fit of the manufactured porcelain crown. The principal features are that it can be mixed to a putty consistence and molded to any de-

sired form, carved and baked without the use of a matrix. Its advantages are simplicity of manipulation, great strength, and an affinity for the cement when set.

Dr. H. T. STEWART, Memphis, Tenn.
"Bridge Work in Pyorrhea."

Dr. Stewart demonstrated a system of crowning which he has devised for adapting bridge work to teeth badly affected by Riggs' disease. Each crown is made in two separate pieces, the pins and cap being made as for the Richmond crown, after the tooth is cut off even with the gum. This is applicable to the root of any tooth, either posterior or anterior. A second floor is now soldered on the first. The caps are now placed in position on the cast, the facing ground to place—facings can usually be used, even on molars—and backed. Behind this facing is built up in wax a spur which is wrapped about with 1/1000 platinum, and reproduced in 20-k. solder. Over this is then burnished or swaged a pure gold cap to an absolute fit. This and the facing are placed in position, the cap waxed to the facing, removed, invested, and soldered. The cap and pin are cemented on each root separately. The crowns are then placed in position, an impression is taken, and the bridge made entirely separate from the caps and pins. This bridge can be used either as a removable or fixed bridge. Among the advantages are—(1) Being able to shape the root and more accurately fit the bands. (2) The abutments are easily made parallel. (3) Each root can be dried and the cap cemented on separately without regard to keeping the other one dry. This is especially advantageous in first, second, and third molars.

The clinician claims to succeed in making and adapting abutments to teeth affected with Riggs' disease that it would be impossible to save by the ordinary systems of bridge work. The only objection to this beautiful and extremely hygienic system of bridge work is the great tediousness of its technique, which requires much time and skill.

Dr. J. H. CROSSLAND, Montgomery, Ala. "Stomatic Prophylaxis."

This clinic was a demonstration of the method of Dr. D. D. Smith. The lower anterior teeth of a young lady were freed from a very extensive accumulation of calculi, and cleansed and polished until their surfaces were immaculate and smooth. The clinician used a scaler of his own design, one of Dr. Thorpe's, and others of different designs, all, except those used for breaking the thick deposits, being extremely small instruments. The cleansing and polishing were done entirely by hand, the Smith porte-polisher being used. Shoe-pegs, suggested by Dr. H. B. Harrell of Texas, and the usual orange-wood were used as vehicles for the pumice, as well as the following accessories, which have been suggested by the clinician: Small brush made for engine porte-polisher, with bristles cut short; "points" of cow's horn, gutta-percha, celluloid, whalebone, white hickory, black gum, Florida ironwood, and "vulcarbo," the latter incased in rubber tubing and held in the porte-polisher or set in celluloid handles. When roughness or very tenacious stains necessitated a more effective abrasive, the vulcarbo points were used before the application of the pumice.

Very long and extremely thin and smooth orange-wood and hickory applicators were used in applying lactic acid. These, he claims, are very valuable also as detectors of calculi, a certain "grating, tearing" sensation being observed when they come in contact with them, owing to their softness and fibrous nature. Lactic acid, mixed with "balsamo del deserto" to stiffen it and cause it to remain longer in the pockets, was used. He has found that gum-arabic is also valuable as a stiffener for this agent. He advocates periodic—generally monthly—cleansing and massaging by hand, believing that stimulation is as potent a factor as is the cleansing, as shown by the splendid results obtained by Dr. D. D. Smith, of whose method of prophylaxis he is an ardent follower. The instruction in prophylaxis which we give our patients, with the inspiration often de-

veloped by it, is deemed by the clinician of more value than any service that may be rendered by the dentistry of the present period.

Dr. A. W. DOUBLEDAY, Boston, Mass. "Combination Inclined Plane and Retaining Appliance." [This clinic has already been published, as given before the Massachusetts Dental Society: see *Cosmos* for February, page 159.]

Dr. H. B. TILESTON, Louisville, Ky. "Hollow Gold Inlays."

The clinic given by Dr. Tileston on the hollow gold inlay as applicable to molars and bicuspid consisted in the adaptation in the usual manner of a piece of pure gold, 36 gage or even thinner, to the cavity, carrying it thoroughly into the occlusal step, and allowing the edge to overlap the cavity at all points. The step portion is reinforced by packing with crystal gold while in the cavity, and melting into this a bit of 22-k. gold. An outer piece of equal thickness of pure gold is cut to fit just within the gingival margin overlap—the overlap is about one mm. wide—and is tacked at that point with a tiny bit of 22-k. gold. The piece is then replaced in the cavity, the matrix re-burnished, and a pledget or several pledgets of wet cotton are packed between the two pieces to force the outer piece to proper contact with the approximating tooth. The outer piece is then bent over upon the occlusal surface, and the patient is instructed to close tightly upon it, which adapts the thin gold to the occlusion. It is then removed, the outer piece trimmed so that its margin lies within the overlap of the matrix, the cotton removed, and the piece replaced in the cavity for correction. The margins are then soldered all around with 22-k. gold or 22-k. solder. A hole is cut in the matrix piece opposite to the axial wall, through which small pieces of 20-k. solder are dropped and melted in the flame of the Bunsen burner until the space between the walls of the inlay are nearly but not quite full, it being left partly hollow for the cement to enter when set. The approximal face of the inlay should

be finished and polished before setting the inlay, the balance being finished afterward like a gold filling.

The advantages claimed are ease and quickness of construction, as neither an impression nor an investment is required; complete protection of the cement, the overlap covering the joint completely; and the freedom from thermal shock to the pulp of a vital tooth, because of the cement in the hollow space in near apposition to the pulp.

Dr. W. R. CLACK, Clear Lake, Iowa. "Gold Filling."

The cavity was in a mesio-occlusal surface of the upper left second bicuspid. An amalgam filling had been placed in the mesial surface. This had failed in its purpose for want of proper extension and retention. After removing it, the cavity was prepared as nearly after the G. V. Black system as was possible, although the progress of the decay had rendered impossible the squaring of the labio-axial angle. Three half-sheet cylinders of No. 4 annealed soft gold were placed in the gingival third of the cavity, and the filling was completed with annealed gold. The gold was then condensed with a No. 3 Wedelstaedt plugger, the stepping of the plugger having been from the center to the cavity margin. The plugger was held at an angle of ten degrees to the walls and cavo-surface angles. A hand mallet of three and one-half ounces weight was used. Interproximal space was gained by wedging the gold against the distal surface of the second bicuspid, and will be preserved by a contact point touching the same surface. Four and one-quarter sheets of No. 4 foil were used. The rubber dam was adjusted from the upper right central incisor to the first molar of the same side inclusive. A clamp was placed on the molar, but no ligatures of any kind were used.

Dr. V. H. JACKSON, New York, N. Y. "Orthodontia—Jackson System." [This clinic has already been published, as given before the Pennsylvania State Dental Society: see *Cosmos* for February, page 198.]

Dr. J. V. CONZETT, Dubuque, Iowa.
"Gold Filling."

This clinic consisted of the insertion of a gold filling in the mesio-occlusal surface of an upper right first molar. The cavity margins were extended gingivally, buccally, and lingually into the areas of comparative immunity. The cavity itself was prepared with flat gingival and occlusal seats and parallel walls, making no undercuts or grooves, but relying for retention upon the general shape of the cavity and condensation of the filling material. After the cavity was prepared it was varnished with sandarac in order to insulate the pulp against thermal shock, and then the cavo-surface angle was carefully beveled all around the cavity. In filling the cavity non-cohesive gold foil was used in the gingival third, two quarter-sheet cylinders were placed in the bucco-gingival and linguo-gingival angles, and three half-sheet cylinders were forced in between them and the whole thoroughly malleted to place. After this the cohesive foil was started in the bucco-occluso-pulpal angle, and the gold was built forward and over the non-cohesive gold in the gingival third, effectually locking it to place. The hand mallet was used with a ten-pound blow, augmented by a hand pressure which varied from five to fifteen pounds according to the situation of the plugger in the cavity, the light pressure being used when great stress was not indicated, and the heavy upon the occluding surface. No previous separation having been obtained, and there being practically no interproximal space, it was necessary to obtain one, which was done by malleting the gold into the space against the approximating tooth, with the result that ample space was obtained.

In finishing the filling the non-cohesive gold was first sawed out of the interproximal space with a Black saw, and the filling was shaped with Wedelstaedt trimmers and a Black knife No. 7. After this the occlusal surface was ground to form with gem-stones, and the whole filling was polished with sand-paper disks, strips, and pumice on a rubber disk.

Dr. A. P. JOHNSTONE, Anderson, S. C. "A New Method of Fitting Crowns and Making Inlays. Mounting Porcelain Crowns with Fixed or Detached Posts."

The crown was ground to fit the root a little under the gum line on the labial surface of the root, allowed to rest on the lingual surface, and it was ground away freely so that it would not touch the approximal surfaces. The prepared crown was used for taking the impression of the root with paraffin and wax. After the wax had hardened, the crown was removed and invested in two cups attached to the instrument especially devised by the clinician for doing this kind of work. A small button of low-fusing porcelain was made and slipped over the post of the crown, resting between the base of the crown and impression of the root. The instrument was then held in a good hot flame until the button became soft and plastic, when the cups of the instrument were gradually closed, thus molding the button to fit the face of the root. The operation produced a nicely fitting crown in a very simple and satisfactory manner.

Dr. D. H. YOUNG, Attica, N. Y. "The Carbon System of Constructing a Porcelain-face Crown."

In presenting this crown I wish to call attention mainly to the points in which it differs from others, especially from the Richmond crown, because when completed it at first sight resembles more closely that particular crown than any other. These differences consist in the method of making the crown, as well as in the qualities which it possesses.

For convenience we will describe an upper central incisor crown:

Position of the Pin. Since the pin of the crown is its main anchorage and support, to this phase of the work should be given the proper amount of care. Pins of crowns are as a rule placed in about the center of the root, but in this crown that portion of the pin which protrudes from the root is placed at about one-thirty-second of an inch nearer the lingual than the labial side of the root.

This change gives two desired qualities: It affords more room and freedom for placing the facing just where it should be, or use of a thicker facing if desired.

The strength and stability of any structure depend upon its foundation, and in the arrangement of the pin just described I believe we will obtain just these very desirable qualities. During mastication, force is exerted upon the lingual surface of the upper front teeth, upward and toward the labial side, and therefore it will be readily seen that the pin in such a position lengthens the load-arm of the lever, for the tooth and its anchorage being analogous to a form of lever, this arrangement makes it difficult for the crown to become displaced.

Removable Facing. The next point of difference is in completing the crown without subjecting the facing to the flame during soldering. In order to effect this, an impression is taken with the cap and pin in the desired position. The facing is ground to fit the space, and the back surface is beveled on the cutting edge at quite an acute angle. This will leave more space for the solder, and consequently greater strength will be gained. The backing material is now placed upon the facing and swaged or burnished to fit the latter perfectly, the backing being allowed to remain flush at the cutting-edge so as to give the surplus needed in finishing the piece. The backing is then carefully removed so as not to distort it, the surface that comes in contact with the facing is painted with whiting, and sufficient solder is placed upon the cutting-edge and flowed to raise it to the degree of fulness made necessary by the condition of the bite. After this the backing is placed upon the facing, and both are put in the desired position upon the cast; a little wax is flowed from the edges of the backing to the adjoining teeth, care being taken not to get any wax on the pins. It will thus be held in position.

The facing is now removed, a little more whiting is flowed over the pinholes to keep the wax from coming through, and as much wax is added to the other side as solder will be required in the finished crown—but the wax should not cover the cutting-edge, which already has

sufficient solder. By the aid of a small drill the wax is bored out of the pinholes. In order to prevent the solder from filling up the pinholes, small carbons—which can be made from a hard lead pencil—are placed in the pinholes from the labial surface, allowing them to extend into the wax from one-thirty-second to one-sixteenth of an inch, but not so far as to prevent the solder from flowing on their ends and producing the complete contour. A second coat of whiting is usually added at this point, covering the carbons and sealing the joints around them, thus preventing any solder from coming through.

Now the case is ready to be invested, which may be done in the ordinary way. By slightly heating the wax it can be removed without disturbing the position of the backing. As no porcelain facing is present, the case may be heated up as rapidly as desired, and when the solder has flowed, without waiting for it to cool, it may be dipped in cold water and separated in a short time. With the aid of a spear-pointed drill, the carbons and the solder which cover their ends are drilled out.

With a fissure bur held at an angle of forty-five degrees, each hole is cut toward its neighbor, in order that the pins may be bent toward each other. A slight film of cement, light or dark as may seem advisable to influence the shade of the facing, is placed on the occluding surface, and the facing is pressed into place. The pins are then bent toward each other into the slots made for them, and the excess is cut off. Bore out the opening left at the outer side of each pin by placing a drill in them at the same angle at which the pin is bent, and drill to the distance of one-thirty-second of an inch or less, as the case may indicate. Then, with a small retention bur, make this little cavity retentive by slightly notching the pin on one side and the gold on the other; fill this cavity with a pledget of gold or amalgam, and the result will be a facing that when cemented will be clenched and keyed. Finish it, and one is positive that he has a crown with a perfect facing, and with better joints, I believe, than it is possible to obtain by

subjecting the facing to the flame. In addition, the color of the facing will not be changed, as may happen if subjected to the flame.

This crown is a sanitary one, for if in any way there should be a space between the facing and the backing which might absorb food debris, such a space will be filled by the cement. The cement also forms a perfect bed for the facing to rest upon, even at all points, and thus any possible strain through expansion and contraction is avoided—strain which by the ordinary method is often within a few pounds of the breaking-point.

In making a crown by this method the gold is not exposed to view if the contour of the gum is normal.

This method of attaching the facing I have successfully adopted in the construction of bridges.

Dr. CRITTENDEN VAN WYCK, San Francisco, Cal. "The Van Wyck Obtunder."

A disto-mesio-approximal cavity in an upper left central incisor was prepared for a gold filling painlessly by the use of this obtunder.

The result was secured by producing anesthesia in the tooth to be operated upon. A spray of perfumed ether is the liquid used. The device consists of three parts: (1) A combination dam-spreader with detachable nose-shield; (2) metallic tubes for delivering the spray, and (3) a glass receptacle for the liquid. After adjusting the rubber dam a piece of cotton is placed upon the tooth, and the spray is directed on the cotton, which is removed in about three minutes' time. The spray, now directed on the tooth itself, is allowed to continue during the entire cavity preparation.

Twenty pounds of air-pressure will produce the spray, and the evaporation of the ether will render the tooth so cold that three great advantages are secured: (1) Painless cavity preparation; (2) painless grinding for crowns, and (3) painless exposures. There will be no after-effects of any kind. Such a tiny spray is used that there is no possible chance for anyone to be affected by the ether, and the Van Wyck obtunder can

be safely used on any person for any cavity or tooth needing attention.

Dr. F. G. CROUCH, Atlanta, Ga. "Orthodontia."

The clinician showed a number of casts of cases at the beginning of the treatment, after it had been in progress for some time, and at the conclusion of the treatment. Success was attributed to the use of appliances suitable to each case, no one system being adapted to all cases. Special cases need special treatment, and some cases were shown wherein correction could be accomplished by the simplest means—as, for instance, in bringing inward and downward a projecting canine, when expansion is not needed; adjusting a round spring-wire over the canine backward against the first bicuspid and forward against the lateral wall. This when sprung into place gives three movements, and as the tooth comes into position the spring is opened from time to time—say twice a week—which the patient himself may do if properly instructed by the dentist.

A special case was shown of prognathism, due to mouth-breathing and thumb-sucking. Correction was accomplished in one year by using Angle's head appliance and retraction bar, and also by wiring the first bicuspid. A special congenital case was shown of retrusion. The models of the case during the treatment showed marked improvement after a few weeks. The maxillæ were very contracted, and the expansion brought about by the treatment was most marked antero-posteriorly.

Another case showed the Jackson appliance for causing expansion and bringing the lateral incisors into position. After several years on this line of practice, the clinician finds it more and more unnecessary to extract teeth for the correction of irregularities.

Dr. L. A. SMITH, Port Gibson, Miss.

Dr. Gibson demonstrated a method of measurements for ordering facings, crowns, etc., for special cases, whereby the dentist may secure the required shape and color in ordering from the dental depots.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canada, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box, 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, MAY 1907.

EDITORIAL DEPARTMENT.

EDUCATION AND MEMORIZING.

SOME years ago the editor of *McClure's Magazine* propounded the interesting, not to say important, inquiry—"Does a College Education Educate?" This led to the publication of a symposium of brilliantly written articles by prominent educational authorities all attempting a solution of the riddle. The essential point of inquiry in all of the articles composing the symposium referred to was the one suggested by the editorial query itself, viz, the implied doubt that the college curriculum is educative in the best and fullest sense.

That our educational systems are not all that can be desired, that they do not produce the results which in certain directions we have *a priori* the right to expect, is not by any means a novel thought, and the justification for a belief that they can be materially improved is found in the critical attitude which so many who are qualified to speak with authority on the subject maintain toward it. In the study of this critical attitude it soon

becomes evident that the bulk of criticism is launched not so much at technical knowledge and the schemes or methods for imparting it, as it is concerned with the results of education as determined by individual character. That is to say, it appears to be rather in its character-forming efficiency than as to its content or method that our educational system falls short of what it should be.

There must always be different educational methods and systems, because of the wide diversity of pursuits in human activity each demanding a different sort of training for the successful accomplishment of its respective end; yet, notwithstanding the almost unlimited variety of objects for which it is the purpose of education to prepare those who are to undertake their attainment, there are nevertheless certain fundamental elements common to the purpose of all departments of education, lacking which they are to that extent defective and therefore incapable of properly fulfilling their purpose, whatever that purpose in particular may be. These essential elementary factors are all those means and methods which have for their object the development of the inherent resources of the individual to an extent that makes him master of those powers that are his natural endowment, and which in their sum total when developed constitute the thing called character. Or, stated in the language of physics, it is the function of education to render kinetic the potential endowments of the individual and to express them in terms of efficiency. Human nature is complex, whether studied *en masse* or individually, yet the ever-increasing tendency to specialization—growing as it does out of the very nature and necessities of our modern forms of social organization—seems to justify if it does not necessitate the one-sided educational development of the individual; hence it is that in fitting our educational systems to our social demands we apparently ignore the fact that we are in some degree crushing out individualism and originality, qualities that manifest themselves only at their best when all of the latent or natural individual powers are developed; and this is done by over-training certain faculties while correspondingly dwarfing others.

In dentistry we struggle unceasingly in our educational processes to reduce the mass of data with which we have to deal to something like order and system. We do this not only with our

science, but with our art as well. We seek for the common chord, the underlying principle, and to this we relate our data so that we may find and use them just as we card catalogue specimens, tools, or book accounts. Were it possible to do this absolutely, to reduce our art and its governing science to a final and complete system, there would seem to be no good reason why the practice of dentistry should not become as automatic as that of mechanical piano-playing. But there is, through it all, the great variant factor of vitality with its protean manifestations, which always introduces the unknown element into the problem—and the unknown element always demands originality for its interpretation; hence it is that no mere automatic routinist in dentistry can ever fully measure up to the demands of his calling. Dentistry demands flexibility of resource, originality, constant adaptability to ever-changing conditions, and the ability to successfully meet new conditions as they arise. These are qualities which our educational system should develop, and develop abundantly, if coming generations of dentists are to be made worthy of their high vocation.

Our present methods of education do not develop the qualities above referred to as they should do, and it is difficult to see how under existing conditions any decided improvement is to be brought about; difficult, because the whole machinery of dental education is lacking in the type of originality that is capable of practically acting upon the ideal that the function of dental education is to make the best dentist. We have copied our system from the kindergarten and from medical educational methods, and have produced a mongrel blend of the two, but our fundamental fault is that we are not training men to think; on the contrary, we are doing their thinking for them and training them to memorize the result. Education is not merely memory training. A well-developed memory is an essential part of the mental equipment of all normal individuals; it is particularly valuable to the practitioner of any department of the healing art; but there is such a thing as over-training the memory at the expense of other equally if not more important faculties—packing the mind with a mass of data to a degree that destroys the power of original and independent thinking. Our whole educational system tends too strongly in the direction above indicated; we seem to

be systematically minimizing the power to reason by emphasizing the ability to memorize, and we test the result by an examination system addressed almost exclusively to the memory rather than to the reasoning faculty.

In the *Lancet* for March 2d there is published an address by Dr. Lauriston E. Shaw, on the "True Aim of Medical Education, and the Evil of the Examination Fetich," which while decidedly unorthodox—indeed, almost revolutionary from the standpoint of the present educational system in medicine—is nevertheless so sanely written and so full of wholesome reasoning that it cannot fail to have its effect in ultimately correcting some of the evils which it criticizes. Dr. Shaw clearly points out the evil effect upon the minds of both teacher and student of the "external examinations" system, by which the student is subjected to an examination by authorities to whom he is known only as a number and who have no knowledge whatever of his personal characteristics nor of the sort of intellectual training through which he has passed. Preparation for the external examination absolutely necessitates the cramming of the memory with all the data from which the limited number of set questions may be selected by the official examiner. The effect of such a method is pernicious not only for the student but for the teacher, who instead of devoting his time and energies to the training of his pupils in the direction of observation and correct reasoning about their work, is compelled to aid and abet in the memory-cramming process and devote too much of his time to furnishing examination tips to enable his pupils to obtain the necessary pass.

Dr. Shaw very truly says in this connection, "What we must aim at turning out of our schools is not the man primed with a complete knowledge of all possible beliefs held by his various examiners at the date of his qualification, but a man capable of criticizing these beliefs with sound judgment even if he has never heard of them before. We must turn out men sufficiently interested in their science to watch with an even mind the shattering of these beliefs by its progress and able to estimate the value of others introduced to take their places. . . . Nothing has been more depressing in recent years than the progress of the idea that a special race of researchers must be bred to advance medical knowledge—men who are to be freed from the

routine of education or practice, safely shut away in their laboratories from students and patients, and prepared for their incarceration by a period of special study, preferably in Germany. . . . To encourage men's powers of research, . . . the power of learning from everyday facts, must be our constant aim. This power exists in every sane human being at birth, and it is the chief condemnation of most modern education that it tends to strangle instead of cultivate it. If we could stop the strangling process so far as medical education is concerned, and turn out all our students able to learn from what they see, the result on the progress of medical knowledge would indeed be satisfactory. But, apart from enabling him to take his share in the general advancement of science, every private practitioner needs for his personal service to the individual patient a high development of his powers of observation and deduction. For the diagnosis of any case no amount of mere fact-knowledge will avail the man who has not trained his eyes, ears, and fingers, as well as his brains, in a way not demanded in the pursuit of examinational success. This fact is indicated by the common observation at the hospitals that the best man at examinations often turns out the worst in the house appointments."

The constantly increasing volume of facts with which the student is concerned and must have at his command in preparation for examination is continually operating in the direction of intensifying the memory-cramming feature of our educational systems, and correspondingly tending to crush out those elements of intellectual activity upon which original research as well as real success in practice is based. The evils of which Dr. Shaw complains we believe to be real and important; they constantly present themselves in various aspects to the minds of those engaged in teaching work, and they are evils which sooner or later must be definitely reckoned with and corrected. It is difficult to suggest detailed methods by which a reform in these matters is to be brought about, but it is quite evident that when our ideal of education is the development of reason, and when we work with that ideal as our objective goal, we shall make greater progress and produce a more efficient type of practitioner, as well as a greater number of scientific researchers, than at present with the examination ordeal as the principal goal of our educational effort.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Revue Odontologique*, Paris, February 1907.]

A CASE OF SEVERE HEMORRHAGE FOLLOWING THE EXTRACTION OF A LOWER MOLAR: TREATMENT. BY ALBERT CANDAU, CHIEF OF CLINIC AT THE ÉCOLE DENTAIRE, BORDEAUX.

Hemorrhage is one of the serious accidents that may follow the extraction of teeth. Dr. Moreau of Paris, who had made a conscientious study of the question, reported already in 1873 twenty-six fatal cases brought about exclusively by post-extraction hemorrhage. Since that time the list of such accidents has been greatly increased, both in Europe and in the United States, as evidenced by the reports published at relatively frequent intervals in the lay, medical, and dental periodicals of these countries. The case reported by Mr. Candau was that of a male adult, for whom the author extracted a lower left third molar under two per cent. stovain anesthesia. After the extraction the alveolus was washed out with a weak, warm thymol solution and with a three per cent. hydrogen dioxid solution. Upon leaving the office the flow of blood from the alveolus had practically ceased. Eight days afterward the patient called again, this time on account of severe pain from which he had been suffering since the day before, and which was doubtless caused by a loose, badly decayed, and broken-down right second molar. The tooth was extracted without the previous use of an anesthetic, inasmuch as the looseness of the organ in its alveolus foretold the easy and uneventful operation which the extraction proved to be. The alveolus was treated as in the previous case, and the patient dismissed. On the morning following the extraction the patient again sought the services of Mr. Candau for the relief of a hemorrhage from the alveolus of the second molar, which lasting as it had since the previous evening, and having resisted the treatment prescribed by the physi-

cian called in during the night, had weakened him almost to the point of exhaustion. After having ascertained that the alveolus was free from spiculæ of bone, and realizing the importance of an immediate intervention on account of the debilitated condition of the patient after about seventeen hours of continuous loss of blood, the essayist proceeded in the following manner: After saturating a tampon of absorbent cotton first with tincture of benzoin and then with sandarac varnish, he carried it to the alveolus and adapted it tightly at the apex and sides. An additional tampon was placed upon the first one, of such dimensions that when the jaws were brought together a reasonable degree of pressure would be exerted upon the alveolus. Even prior to the application of the second tampon, the hemorrhage had practically ceased. To prevent the displacement of the tampons a bandage holding the jaws immovable was applied; this was removed some hours afterward, at which time the hemorrhage had been completely arrested.

The patient was not a hemophilic. No member of his family had ever suffered from this disturbance; he had passed the age at which the manifestations of hemophilia are frequent, and in addition neither a number of wounds which he had suffered in the course of his life, nor the extraction eight days previously of a third molar solidly set in its socket had given rise to any undue loss of blood. The patient had never suffered from epistaxis, a symptom of hemophilia, and showed complete absence of spontaneous ecchymoses or petechiæ, both stigmata of hemophilia. On the other hand, it is well known that certain intoxications, i.e. alcoholism and such disturbances as albuminuria, nephritis, rheumatism, cardiac disorders, etc., predispose to hemorrhage, but none of these conditions had at any time existed in this patient. A careful consideration of the clinical history and the fact that the hemor-

rhage was arrested through mechanical means led the writer to conclude that it had been caused by the rupture of an aneurysm of the inferior dental artery.

[*Revue de Stomatologie*, Paris, March 1907.]

BRUXOMANIA (GRITTING OF THE TEETH). BY DRS. MARIE AND PIETKIEWICZ.

Under the term "bruxomania," the authors designate the habit of gritting the teeth as observed in patients having a lesion or some definite alteration of the central nervous system, either temporary or permanent. Bruxomania should be differentiated from mandibular trismus, inasmuch as the latter is brought about by a spasmodic contraction of the elevators of the lower jaw, and cannot be overcome ordinarily either by a voluntary effort on the part of the patient or by outside force. Gritting of the teeth, on the other hand, brings into play a greater number of muscles—practically all the muscles of mastication—and is arrested after a certain time either through a spontaneous effort on the part of the patient himself or following the emphatic command of another person. Neither does bruxomania, properly speaking, refer to the involuntary grinding of the teeth that is apt to occur in the course of such acute cerebral diseases as meningitis of the base of the brain or of those general diseases, such as nephritis, which induce systemic intoxication involving the cerebrum; it refers only to those cases of gritting of the teeth in which the act is the result of some lesion in the cortex, probably in the neighborhood of Broca's region in the ascending frontal convolution. Bruxomania has been observed in paralytics at any stage in the evolution of the disturbance, in the third period of spasmodic hemiplegia of infancy, in dementia, epilepsy, chorea, in Little's disease, etc. In all these disorders it is invariably associated with disturbances of speech, aphasia, and with monoplegia of some form. Bruxomania appears spontaneously, and the sound caused by the gritting and grinding of the teeth is occasionally of such volume as to interfere—in the case of hospital patients—with the sleep of those in adjoining cots. Some bruxomaniacs grind their teeth for only a few moments each day; others for entire days, weeks and months, and still others do

not cease even during sleep. In some cases it ceases and disappears spontaneously, and in others it persists until death. Bruxomania which has lasted for several years brings about characteristic lesions of the teeth. All the teeth are worn down flat, appearing as if ground with a stone wheel. The anterior teeth, in particular, are occasionally worn down almost to the gingival margin. The authors, after a long and painstaking clinical observation, report upon twelve cases of disorders of the central nervous system in which bruxomania developed. Among those cases there were two of general paralysis; one of Little's disease; two of dementia; one of organic dementia complicated with right hemiplegia and transitory aphasia; one of intellectual debility due to chronic alcoholism; one of general paralysis complicated with intellectual debility and absence of self-consciousness; one of general paralysis with embarrassment of speech; one of senile paralysis with embarrassment of speech; one of general paralysis in the later stages, and one of general paralysis with complete speech interference.

[*Le Laboratoire*, Paris, March 24, 1907.]

A REVIEW OF THE "MANUAL ON THE ART OF THE DENTIST" BY JOURDAN AND MAGGIOLLO (PUBLISHED AT NANCY, JANUARY 1807). BY B. PLATTSCHICK, PARIS.

Dr. Jourdan, of the faculty of medicine of Montpellier, and M. Maggiolo, surgeon-dentist of the faculties of Genoa and Pavia, published in January 1807 a work in French entitled "*Manuel de l'Art du Dentiste*," in which they discuss the manner of preserving the teeth in good condition, the mechanical improvements discovered by Maggiolo, and some practical suggestions on the use of artificial teeth, their manufacture, etc.

This manual is, in the opinion of dental historians, the best work on dental technics written in the French language up to the time of its appearance and for many years thereafter. Carefully prepared and containing a considerable amount of interesting and valuable information on dental prosthesis, the manual was to be found in the hands of practically every dental practitioner of the time. Throughout the book the authors furnish ample evidence of a

thorough comprehension of the rôle and function of the teeth, and "deplore that during the eighteenth century—a century of enlightenment—so little should have been done toward the preservation of the teeth—organs indispensable for a thorough mastication and consequently for good digestion; organs which to a large extent contribute to the beauty and sonorousness of the human voice; organs which prevent the occurrence of buccal affections, the alteration of the breath, and even those diseases of the chest too frequently caused by carious teeth."

Being anxious to remedy this condition of things, they prepared the manual, whose essential purpose was to make good practitioners of dentistry by teaching dentists in detail how they themselves might construct all the varieties of artificial teeth in use at that time.

They express themselves in favor of preserving the roots of teeth by such means as fumigations with pyrethrum (pellitory) or calamus (sweet-flower), and by the introduction of opium seeds from time to time into the carious cavity. If after three or four days of such treatment the tooth fails to recover, the operator may resort to extraction. For the performance of this operation they recommend Garengnot's key, and condemn the pelican.

Considering the otherwise progressive and practical tendencies of the authors, it is astounding to find that they were most emphatically opposed to the use of porcelain for prosthetic purposes. They admit that it is possible to imitate the exact contour of the gums, but such substitutes never fit accurately, owing to the contraction of the porcelain.

"It is necessary," they say, "for those having to wear porcelain dentures to exercise an unusual degree of patience," and in support of this opinion quote Gariot, who although a strong partisan of porcelain, avows that it requires about six months for a patient to become so accustomed to a denture as to enable him to masticate with facility. In addition, they claim that the denture cannot be tried in until after the piece is removed from the furnace, and that the porcelain paste does not imitate the natural teeth as accurately as does the ivory of the hippopotamus and of the sea-horse. Therefore Jourdan and

Maggiolo aver that they will never employ porcelain.

A very important chapter of the book is the one in which the preparation of the base upon which the artificial teeth are to be supported is described. After unfavorably criticizing the methods then in vogue, they recommend and describe as the first step of the operation the obtaining of an impression of the mouth with wax. Although M. Platschick does not make any further allusion to the history of the introduction of wax and plaster for obtaining impressions of the mouth, it may not be considered amiss to recall in this connection that it was Philip Pfaff, dentist to the King of Prussia, who in his work on odontology, published in 1756, referred for the first time to wax and plaster impressions; and that some time prior to 1756, Geoffroy Purmann was the first to avail himself of plaster for the same purpose.

In the chapter of the manual devoted to pivot teeth, a description is to be found of a method of crowning which, in the main, consists of fitting a tube in the root-canal intended to receive the pivot of the crown substitute—the crown of an extracted tooth—to which the pivot is attached by means of a small piece of gold plate riveted at the lower extremity of the pivot, and within a transverse groove on the lingual surface of the crown. In addition, they recommend, instead of the plain vertical pivot, one made by bending a piece of wire upon itself in such a fashion that when one end is embedded in the crown and the other left free, the pivot will have sufficient springiness to hold the crown in place, while at the same time allowing for its removal whenever necessary without unduly straining the root.

Jourdan and Maggiolo also recommend implantation of artificial tooth-roots in cases in which the original root is so loose and broken as to preclude the possibility of its supporting an artificial crown. "Extract the old root, and introduce into the alveolus an artificial root. A month later attach a pivot tooth to the root." They feel that this operation may be considered as one of the most beautiful within the art of the dentist, offering precious advantages and giving satisfactory results.

The authors devote several chapters to the process of making full dentures, and in this connection express themselves in favor of re-

taining such roots as may remain in the mouth. They call attention to the valuable services that these roots may be made to render, and condemn the use of metallic bands fitted around teeth for the support of dentures, as such teeth soon become loose and their necks exposed, owing to recession of the overlying gum tissue. They likewise speak unfavorably of the type of springs then in use for the retention of full dentures, saying that their presence prevents the opening of the jaws to the normal extent, and consequently the proper and thorough mastication of food, which under the circumstances becomes painful. Also, that they interfere with speech, and that their presence in the mouth makes their wearers hesitate even to sneeze or to blow their noses. The authors remedied all these inconveniences by devising a spring which obviated all of the above-mentioned disadvantages.

[*Berliner Zahnärztliche Halbmonatsschrift*,
Berlin, March 5, 1907.]

TUBERCULOSIS OF THE MUCOUS MEMBRANE OF THE MOUTH. BY DR. BERNSTEIN, COPENHAGEN.

Tuberculosis of the oral mucous membrane is but rarely observed. It may occur in the course of pulmonary tuberculosis, or as a primary infection. The ectogenous form attacks most frequently the nasal mucous membrane; while the endogenous form attacks the mouth and throat. The latter occurs with greater frequency than the former, which as a matter of fact may be considered in the light of a medical rarity. Petit mentions a case of primary tubercular infection of a retro-maxillary gland. Another case was that of a man with primary tubercular infection of the submaxillary gland and pharyngeal lymphatics. Scholl mentions a case of labial tuberculosis in a man otherwise free from the disease.

Regarding cases of secondary infection, Jaruntowski mentions the case of a consumptive in whom an ulcer developed in the mucous membrane posterior to the lower left third molar, which eventually involved a considerable area of mucous tissue. The molar was decayed, and the cavity was found filled with debris rich in bacilli tuberculosis. Jaruntowski reached the conclusion that the infection had originated from the cavity of de-

cay. As a rule, however, most cases of buccal tuberculosis occur as a secondary manifestation in consumptive patients. The author himself has observed the following two cases:

Case I was that of a patient thirty-seven years of age, presenting a granular infiltration of the mucous membrane in the vicinity of the upper left canine. The inflammation spread following the extraction of several teeth, and was doubtless secondary to pulmonary infection.

Case II was that of a young woman twenty-one years of age, who presented an ulcer of six years' standing in the labial mucous membrane. The ulcer had not been previously treated, as it did not in the least inconvenience the patient. Lately, however, the infection having spread, it has involved the cheek, which appears swollen and contains an infiltration of the size of an ordinary bean. It did not present the characteristic granular appearance of tubercular infection, although the specific bacillus was isolated from the ulcerated area. Thus far treatment with hetol injections, lactic acid, Finsen light, etc., has failed to relieve the inflammatory phenomena.

[*Lancet*, London, November 3, 1906.]

A CASE OF ACTINOMYCOSIS OF THE CHEEK CURED BY POTASSIUM IODID; WITH SUGGESTIONS AS TO THE POSSIBLE MEANS OF INFECTION AND SPREAD OF THE DISEASE. BY ROBERT KNOX, M.D., M.R.C.S., ETC.

After calling attention to the importance of an early diagnosis in actinomycosis, the author reports the case of a child aged seven and a half years, who in little less than a year's time completely recovered from an attack of actinomycosis of the cheek, under gradually increased doses of potassium iodid until a maximum of gr. xlix per diem was reached. The swelling of the right cheek was situated midway between the mandible and the maxilla, and was of about the size of a small walnut and was irregular in outline. Small areas of softening could be detected on digital examination, and semi-fluctuation could be elicited on carefully palpating the swelling with one finger in the mouth and the other on the cheek. At these points the cutaneous surface was greatly thinned out and presented a bluish-red color. When first

seen there were several places on the surface where the inclosed pus tended to point, and a thin crust was already forming over these points. On carefully examining the buccal mucous membrane several small abrasions could be detected, and it was obvious that the infection had originated at these points. The abrasions had been caused by two lower molars which were in a state of advanced decay and had very rough edges. The patient presented such constitutional symptoms as rapid pulse, 104 per minute, and a temperature in the evenings of 104° F. The child had lost weight, was very lethargic in her movements, and complained of feeling tired. Suspecting the nature of the disease, Dr. Knox opened the abscess, and the typical granules were seen in large quantities. One of these was teased out in water, and showed on microscopic examination the mycelium of the fungus. The treatment consisted in the removal of the diseased teeth, the use of an antiseptic mouth-wash, the application of hot boric fomentations on the cheek, and the internal administration of potassium iodid, as above stated.

Concerning the way in which the parasite gains entrance into the body, the author believes that while in some cases it is carried on straw or grain, in other cases the method of infection remains a mystery. It is sometimes communicated by direct inoculation from one individual to another, while there are cases on record in which the disease was acquired through the consumption of infected meat. To the eradication of the latter source of infection the larger share of prophylactic measures should be directed.

[*Revue Odontologique*, Paris, February 1907.]

DENTIFRICES. BY DRs. CARLE AND PONT,
LYONS, FRANCE.

In the course of their investigations on the composition and properties of tooth-powders, the authors (*Le Monde Médical*) have found that salol, which, as is well known, has been repeatedly incorporated in tooth-powders, exercises such detrimental effects upon the lips and soft tissues of the mouth as to render it in this connection both useless and injurious. They have collected five cases in which perilabial eczema was arrested, and eventually cured by the elimination of salol

from the tooth-powders that were being used by those so affected.

Drs. Carle and Pont then take up the question of the sterilization of the human mouth, and reach in this connection conclusions which are entirely in accord with the opinion of the reviewer, namely, that the use of purely therapeutic agents in the attempt to sterilize the mouth is a procedure of questionable efficacy, inasmuch as the results are lasting only in proportion to the frequency and thoroughness with which such agents are employed. Whatever beneficial results are obtained from the use of solid or liquid dentifrices must in the main be attributed to the degree of mechanical action used in connection with them, and not to the disinfectant or germicidal properties of their ingredients.

In the opinion of the essayists a good dentifrice is the one which in addition to exercising a mechanical action, thus freeing the teeth from all deposits of extraneous matter, will neutralize the acid end-products of carbohydrate fermentation. Finely prepared chalk, magnesium carbonate, and sodium bicarbonate—faintly or not at all aromatized—constitute the simplest and best dentifrice ingredients. They may be combined in a formula as follows:

Magnesium carbonate,	3iij;
Calcium carbonate,	3iij;
Oil of peppermint,	gtt. x.

[*British Dental Journal*, London, March 1, 1907.]

A CASE OF REPLANTATION. BY MR. FREDERICK LONNON.

The author reports the case of a boy aged sixteen, who was struck in the mouth by a ball while playing cricket. The impact of the ball forced out the upper right central incisor, which, after lying upon the ground for about an hour, was taken to Mr. Lonnnon, who after placing it in a mercury bichlorid solution removed the pulp, filled the root-canal and pulp-chamber, syringed the socket with a 1:2000 mercury bichlorid solution, and then replanted it. On the day after the replantation a splint embracing the adjoining teeth was cemented; this was removed three months afterward. The tooth, which has now been *in situ* for six months, is in perfect condition.

PERISCOPE.

Mouth-wash for Thrush in Infants.—

R—Potassium chlorate,	4 gm.
Distilled water,	200 "
Tincture of myrrh,	3 "

Sig.—Use as a mouth-wash.

—*Vierteljahrsschrift für prakt. Pharmacie.*

To Locate the Irritating Portion of a Plate.—As it is sometimes difficult to locate just exactly the irritating spot of a plate, place with a spatula a little wet whiting about the locality of the trouble, put the plate in position, and the precise spot will be readily seen.—L. P. HASKELL, *Dentist's Magazine*.

Rusting of Iron.—Dr. Gerald T. Moody has contended that iron cannot rust in the absence of carbon dioxid, but Dunstan has repeated the experiments, and the results show that iron rusts freely in the absence of carbonic acid, provided that iron, oxygen, and liquid water are brought together.—*Chemist and Druggist*.

Mouth-wash for Syphilitic Ulcers.—

R—Hydrarg. chlorid. corrosiv.,	0.2 gm.
Alcohol,	2 "
Tincture of myrrh,	100 "
Decoction of cinchona,	150 "
Honey of rose,	45 "

Sig.—Use two or three times a day as a mouth-wash.

—*Vierteljahrsschrift für prakt. Pharmacie.*

Remaking a Plate Without a New Impression.—Make a model by sticking all the pieces together with sealing-wax. Then the plate is invested in the ordinary way in the flask. When the plaster has set, the sealing-wax holding the pieces together is removed, and a thin coating of beeswax is placed over the old rubber plate to make allowance for scraping and polishing. When this is done the old plate, teeth, and surrounding plaster are freely coated with oil. The upper half of the flask is then filled with plaster. It is allowed to stand only about ten or fifteen minutes, so that the plaster should not set too hard around the teeth. The flask is then separated by placing the blade of a knife between the parts, leaving a nice impression of the teeth in the

plaster of the upper half of the flask. The lower half of the flask, containing the old plate and teeth, is held over a spirit lamp, when the teeth are easily removed, and are replaced in their respective positions in the plaster impression in the upper part of the flask. There is no trouble in picking out the old rubber plate when heated. All that has to be done is to pack and vulcanize in the ordinary way.—J. NEELANDS, *Dominion Dental Journal*.

Pointers on Porcelain Inlays.—One of the first essentials in inlay work is to have plenty of room for taking the impression, and I think I need hardly add that there should be no undercuts, and that the edges should be strong and well defined. In a small cavity it is well to make it of a definite shape, so that you will at once recognize the method of insertion when you come to fix it, and thus save yourself considerable trouble. Overhanging edges, if strong, need not be removed, for if there be undercuts the impression may easily be obtained by filling them up with a little gutta-percha, which should be afterward removed.—R. HILL, *Dental Record*.

Calcium Chlorid as a Hemostatic.—Calcium chlorid as a hemostatic is best administered, according to Rosod (*Therap. Monatsschrift*, No. 12, 1906), in the following combination:

R—Calcii chloridi,	gr. lxxv to cl;
Aquæ destillatæ,	℥iijss;
Syrupi menthæ,	℥v. M.

Tablespoonful doses are given during twenty-four hours. In some cases a clyster containing 75 gr. of calcium chlorid with a few drops of tincture of opium is given.—*New York Medical Journal*.

Ichthyol in the Treatment of Pericemental Abscess.—We have all had to deal with those very painful acute conditions sometimes arising in the pockets in interstitial gingivitis—usually those in which no pus is discernible—producing the most intense odontalgia, and often resulting in pericemental abscess. For many years I was absolutely without a remedy for this condition, and when I read an article recommending ichthyol I was very skeptical, as it seemed

rather far-fetched to expect a drug of this kind to relieve pain to any extent. However, having no other remedy, I tried it, and have used it ever since. I do not attempt to explain its *modus operandi*, but can say that in about six years I have never failed to get positive results—almost always immediate and complete relief from the pain; in the cases when the relief was not quite complete, it was nearly so. Ichthyol is a thick fluid, about the consistence of molasses, and with a small flattened silver wire, which can be easily bent and also sterilized in the flame, it is an easy matter to work it into any of the pockets. It is my practice to then paint the gum surrounding the affected root with the ever-ready aconite and iodine mixture. The beneficial effect generally lasts about twenty-four hours, a second application usually being sufficient to bring the pocket to the point where it may be treated radically.—A. J. COTTRELL, *Dental Brief*.

Care of the Plate After Vulcanizing: Avoid Rapid Cooling.—Having vulcanized the piece, do not cool it rapidly if the investment has been of plaster of Paris, because sudden cooling tends to a warping. The writer once caused a vulcanite plate to crack severely by rapid cooling, the investment having been of plaster of Paris hurried into the vulcanizer soon after mixing. Having opened the flask, brush away the plaster adhering to the plate, or if it be very adherent, immerse it for ten or fifteen minutes in fifty per cent. aqueous solution of sulfuric acid. This will soon soften the plaster so that it may easily be brushed away, and will not injure the vulcanite. Hydrochloric acid, however, rapidly dissolves aluminum.—STEWART J. SPENCE, *American Journ. of Dental Science*.

Mouth-wash in Pyorrhea Alveolaris.—The following prescriptions are given in the *Practitioner*:

R—Potassii chloratis, 3ij;
Glycerini boracis, 3v;
Aq. rosæ, ad 3x. M.
Ft. lotio.

If the patient has spongy gums which are liable to bleed readily, the following mouth-wash is recommended:

R—Tinct. myrrhæ, 3ss;
Tinct. krameriæ, 3ss;
Tinct. cinchonæ, 3ss;
Tinct. catechu, 3ss;
Eau de Cologne, 3j. M.

Sig.—A large teaspoonful in a wineglass of water, to be used as a mouth-wash frequently.

Burney Yeo recommends the following as an antiseptic and soothing mouth-wash for adults:

R—Potassii chloratis, gr. lxxx;
Extr. opii liquidi, 3ij;
Aque lauro-cerasi, 3j;
Decoct. hordei, ad 3viij. M.
Ft. lotio.

Or the following:

R—Acidi salicylici, gr. xxxij;
Spts. vini rect., 3iij;
Aq. camphoræ, ad 3viij. M.
Ft. lotio.

Sig.—Dissolve the acid in the spirit and then add the water.

—*New York Medical Journal*.

Amalgam Restorations Better than Gold Crowns.—In restorations involving more than one wall, a band matrix should be used. It can be made either of thin copper or the Angle band material, which comes in different widths. Dr. Clapp of Boston ties and wraps his matrices with a ligature, but I prefer them soldered to fit the case in hand; or I have enough made up of different sizes so that one can be selected to fit. Bands should be firm enough to withstand the lateral pressure of heavy condensation. They should fit as closely as possible at the gingivæ, and yet allow for contact points. An orange-wood wedge will nicely preserve the interproximal space and help to hold the band. If I feel that I cannot obtain sufficient anchorage in the tooth to withstand the probable strain, I set one or more pins in the canals.—GEO. R. WARNER, *British Journ. of Dental Science*.

Method of Obtaining Sticks of "Sticky-Wax" by Casting in Glass Tubes.—Obtain several—say a dozen—lengths of glass tubing. Pieces about one foot long are convenient, but much longer pieces may be used. The tubing should have fairly thick walls. The bore may be of any diameter, though three-sixteenths to one-fourth inch gives convenient sticks of wax. The ends of the tubes should be ground, not melted smooth, as melting lessens the bore at the point of fusion.

Thoroughly clean the tubes and dry the inside by pushing pieces of cotton wool through them. The tubes must then be "lubricated," to prevent the wax from sticking. Do not lubricate with oils. Glycerin forms a very effective lubricant for this purpose, and is easily applied by saturating pieces of cotton wool with it and pushing them through the tubes.

Having the wax melted and the tubes "lu-

bricated," fill each of the tubes as follows: Attach a piece of rubber tubing to one end of a glass tube. Take the other end of the rubber tubing in the mouth. Dip the free end of the glass tube into the melted wax and suck the wax up until the tube is full. Pinch the rubber tubing close to the glass tube, and the tube, full of wax, can then be lifted and laid in a horizontal position. Then release and remove the rubber tubing. The wax will not run out. Repeat the process until all the tubes are filled. When cool, the sticks of wax can readily be pushed out of the tubes. If a piece of wax should stick in a tube, it is either because the tube was not properly lubricated or because its bore was not uniform. I have cast sticks of wax over a yard long by this method. In melting the wax it is better not to use direct heat, but to put the wax in a tin and stand the tin in boiling water. Ordinary pink wax may be cast into sticks for 'waxing up' in the same manner, but owing to the much greater fluidity of pink wax when melted, it is more difficult to manipulate.

The following is a formula for sticky-wax: Pure white beeswax 4 oz., pure light yellow resin 7 oz., pure gum dammar 1 oz., dye q. s. to color. Powder the resin and gum dammar, and add little by little the melted beeswax.—*Dental Record*.

Tooth-Powders.—Tooth-powders and dentifrices were in common use long before tooth-brushes were thought of. Whereas the latter articles were unknown, in England at least, until the seventeenth century, the former were in common use among the ancient Romans. Ovid, who dealt greatly in polite matters—and not a few impolite matters also—gives various recipes for the manufacture of preparations for washing the teeth. As brushes for the teeth were unknown in those days, these dentifrices were applied by means of the bare finger or a rag wrapped around it. Not infrequently a "tooth stick" was resorted to for the purpose. This, usually an orange-wood stick with a small rag around it, came later into general use. In the present day, millions of Hindus and Chinese clean their teeth with small pieces of wood.

Old medical books are very quaint and interesting on the subject of tooth-powders and dentifrices. One gives a very primitive prescription for "a dentifris or powder for the teeth." It says, "Burn a peece of corke till it looke like a coale, then take it out of the fyre, and it will fall to ashes, wherewith rub your teeth." Another recommends "rubbing with a coarse cloth" and finishing up with "a peece of scarlet dipped in hony."

Yet another maintains that there is nothing like pounded china in the way of a good tooth-powder. This tooth-powder is certainly unique, and one is tempted to admit that, whatever its merits, there is indeed "nothing like it." An unlucky wight, mentioned by Surtees, found this out to his cost. It appears that on the way to New York in a coach, he "eat some raisins which in his pocket happened to mix with a dentifrice made of beaten china." This made him so ill that he "had like to die on the road." The maker of such a dentifrice should have labeled it "For the teeth—thus far and no farther." It seems, from this chronicled incident, that it was the custom in those days to carry one's dentifrice loose in the pocket, as the South African does his tobacco.

Another favorite dentifrice of the seventeenth century was water and salt applied with a rag, or by means of a stick made of lentisk, walnut, or liquorice root. Some of these "tooth sticks" were fashioned at one end for use as toothpicks. But in those days it was only the dandies who used a specially made toothpick. Even as late as the nineteenth century we read of Beethoven lying on a couch listening to his own sonatas while he picked his teeth with the snuffers.—*British Journ. of Dental Science*.

Influence of Defective Nasal Breathing on Growth and Development.—Among the functions subserved by the nares in the respiratory process are the heating of the inspired air and the addition of watery vapor, as well as the filtration of particles of solid matter. If this mechanism be deranged from any cause, infection is likely to take place, with resultant catarrhal disturbances and impairment of hearing in case of extension to the Eustachian tube. If nasal breathing be obstructed, especially in children, only imperfect expansion of the lungs can take place, and deformity of the chest results. A certain amount of adenoid tissue is present normally in the naso-pharynx of healthy children, but an excess appears to cause effects apart from the obstruction of breathing to which this gives rise. The mouth-breathing child with adenoids not only presents a dull, stupid look, but also seems intellectually below the average, and is usually stunted in general growth. The improvement in all directions following removal of such excessive adenoid tissue is a most striking and convincing phenomenon. In a discussion of this subject in a recent communication, Dr. P. Watson Williams emphasizes the physiologic importance of the nose in influencing respiratory activity, and the pernicious effect of the absence of the nasal respiration, not alone on account of the

commonly recognized results of unwarmed, unmoistened, and unfiltered air reaching the lungs, but also from the persistent abrogation of nasal respiratory stimulation. At the same time he does not underestimate the factors responsible for the defective physiologic activity of the respiratory centers in children suffering from enlarged tonsils and adenoids, especially chronic sapremia, causing tissue inactivity, and hence absence of the normal need for more rapid respiratory exchanges. Children who persistently fail to expand their lungs fully, or in whom the respiratory exchanges are subnormal, are underfed, for a due supply of inspired oxygen is essential for the utilization of food in the processes of internal respiration. Accordingly, after the removal of abnormal conditions in the nose and throat, it is wise to recommend activity in the open air, cold baths, and particularly physiological drill, comprising appropriate respiratory exercises, in order that the listless, partially asphyxiated child may grow up in the fulness of life.—*Journ. Amer. Med. Association.*

Obtaining Plaster Impression Without the Use of Trays.—In doing this the first thing is to have the patient rinse the mouth with milk of magnesia. This lubricates the teeth, and makes it possible for the plaster to get a close adaptation to the teeth without sticking to them. In taking impressions sometimes the plaster is mixed entirely too thick, and you do not get the fine, nice line you can with thin plaster. If the plaster is mixed so that it will not drop in chunks, but runs off, you can keep on piling up until you have got sufficient surface, so that you will have as much bulk of plaster as you would in an impression tray. But the trouble with an impression tray is that as it is pushed to its seat it almost invariably touches some place, some vulnerable point, and that cuts through the plaster, so that when you take the impression tray away and draw the sections apart, the plaster in many places is so thin that you cannot find the little piece that has broken away, and consequently a hole is left that is nearly always at the wrong point. I feel that I can build up partial impressions very much better without an impression tray than with it. One advantage is this: You can get more bulk of plaster around certain parts of these teeth, and after the plaster has become hard it will not readily move out of place—but still it is easily cut with a spatula or a sharp lancet and removed.—WILLIAM H. TAGGART, *Dental Review.*

What Gold Foil Annealing Really is: the Advantages of the Electric Annealer.

—It is well known that there is little difference between cohesive and non-cohesive gold as it comes from the manufacturers, except that the non-cohesive has ammonia gas condensed on its surface. Both are purified, beaten, and annealed in the same manner, but just previous to marketing, a part of the lot is passed through ammonia fumes and marked non-cohesive, simply because the fumes form an imperceptible film which, while not affecting the purity of the gold itself, prevents intimate cohesion of the different layers of gold. From this we may see that a pellet of cohesive gold may be made non-cohesive by exposing it to the influence of ammonia gas, and this pellet thus rendered non-cohesive may in turn be made cohesive by driving off the gas with heat. This latter process is what we actually accomplish in our everyday operations with non-cohesive foil when we heat it, and it is in no way intended to anneal the gold.

The so-called "annealing" of gold foil is not analogous to, nor in any way connected with, the annealing of plate gold which has become hard by hammering, and which has to be raised to a red heat to relieve it of the state of strain. Much of the difficulty experienced by operators in the insertion of gold is undoubtedly due to faulty methods of giving it the heat treatment, and even among operators who are sufficiently skilled to obtain good results by the ordinary methods, there is much to be gained by adopting some of the more recent advantages that are offered us in the use of the so-called "electric gold annealer." Most operators are in the habit of heating their gold by passing it through the flame of a spirit lamp, or a Bunsen burner, but in either instance we are never certain of always having a pure flame; besides, there is not one in a dozen that understands that he is removing gases, and not developing cohesion, which is an inherent quality of the pure clean gold itself. To remove these gases uniformly and completely, a comparatively low heat and more time is required, and this is best accomplished with an electric annealer. It has been shown by experiment that the cohesive property of ordinary gold foil as it comes from the manufacturers shows itself at about 250° F., after which nothing is gained. As this heat is not visible, many dentists who have not tried the gold annealer with its low heat believe that the gold annealed in this way is not thoroughly annealed, but clinical use shows it to be most cohesive.—M. C. WARD, *Dental Register.*

HINTS, QUERIES, AND COMMENTS.

METHOD OF REPLACING A FACING ON AN ANTERIOR BRIDGE.

THIS is a very simple but effective method of replacing a facing in cases where it has been broken off, leaving the pins intact within the metallic portion of the bridge. Let us take as an instance an anterior bridge from canine to canine, where a facing has been broken off. Having a napkin and cotton roll in place to keep the parts dry, and making sure that the pins are straight so as to permit the removal of the matrix, platinum 1:1000 is pressed into place over the pins by means of a piece of rubber. The matrix is then burnished into the position occupied by the lost facing, care being taken that it is burnished laterally over the adjacent teeth far enough to serve as a guide for the necessary contour. Care should also be taken to have a slight projection of the matrix at the incisal edge, and at the cervical margin the matrix should touch the gum and be trimmed in alignment with the other teeth, or as the case may indicate.

The matrix being fitted we are now ready to add the porcelain. The Parker body is best suited for this work, on account of its easy manipulation—it being of a putty consistence—as all these steps are done in the mouth. When the desired contour and length are obtained, the piece is removed and bisected. The porcelain in this state being like chalk, the holes for the pins may be slightly enlarged in it with a small round bur, to allow for the easy readjustment of the matrix. The enlargement of the holes for the pins also allows for the shrinkage in the final baking.

The matrix is readjusted and the enamel added, after which it is placed in the oven and given the final baking. When cool, remove the matrix from the facing, and after etching the porcelain with hydrofluoric acid—which can best be done by pressing the facing labial side downward into beeswax up to the margins—the facing is ready to be set. Before

setting, however, it is well to roughen the gold by means of a bur or excavator, in order to secure better adhesion for the cement. Ordinary cement may be used. The advantages of this method are that the work is all done in the mouth, in a comparatively short time, and at one single sitting.

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Boston, Mass.*

TO SECURE DRYNESS IN LABIAL CAVITIES.

To prepare and fill cavities in labial surfaces of the six upper anterior teeth, place a cotton roll under the lip directly over the root of the tooth to be filled, then cut a piece of silk floss about twenty-four inches in length, double it upon itself, and tie the ends together. After having placed the floss over the tooth, and drawn it well up against the lingual surface, pass the silk over the patient's face, allowing it to rest upon the cotton roll and lip, and with a weight on the other end of the string, let it fall over and behind the patient's head. This, with a little help on the part of the patient, will enable one to fill all such cavities without the use of the rubber dam, very much to the satisfaction of the patient as well as that of the operator.

E. S. RICHARDS.

Hope, Ark.

PREPARATION OF MATRIX FOR CAVITIES EXTENDING UNDER THE GUM.

DOUBTLESS all inlay workers have experienced trouble in getting the matrix to cover the cervical border of the cavity, especially when situated above the gum line. This can be readily overcome by cutting the gold to the proper shape, and then turning the upper margin over about one-sixteenth of an inch or less.

Hang the matrix by means of the fold thus produced on a fine silk thread, and press the fold down so that the thread and gold can be carried to place, in order to use the thread as a binder to hold the matrix in place. After burnishing the matrix to position, cut one end of the thread near the gold and draw the other end out. This arrangement reinforces the upper margin and prevents bending the matrix during its removal from the cavity. Try it once and you will find it indispensable.

T. S. PHILLIPS.

Buffalo, N. Y.

AN INTERESTING CASE IN PRACTICE.

Mrs. M., age thirty-seven, was cured of headaches and relieved of the necessity of wearing glasses, after the extraction of a tooth which was the seat of an abscess. She had suffered for nearly two years from severe headaches accompanied with an im-

pairment of the right eye, and had been wearing glasses for over a year, which partially relieved the condition.

She came to me to have an upper right central incisor treated on account of its discoloration. I opened into the tooth and found the root-canal filled with cotton. Upon the removal of the cotton there was a discharge of pus, and by instrumental examination I found the apical third of the root to be softened, and also found a large opening beyond, together with some destruction of the alveolar process. I advised immediate removal of the tooth and curettement of the alveolus, which I did under nitrous oxid. The opening was packed with aseptic gauze for a few days, and then allowed to heal. The headaches disappeared, and the glasses were discarded within a month. Two years later I saw the patient, and there had been neither recurrence of headaches nor impairment of eyesight.

LEGRAND M. COX.

St. Louis, Mo.

OBITUARY.

DR. J. HALL MOORE.

DIED, of heart failure, at Richmond, Va., December 28, 1906, J. HALL MOORE, M.D., in his seventy-fifth year.

Dr. Moore was the son of James Moore, who came from the north of Ireland in 1800, and was one of the first settlers of Washington, D. C., at which place Dr. Moore was born in 1832. Dr. Moore studied dentistry for five years with Drs. Luther Parmele and William Malster, and in 1853 began the practice of his profession. His medical education was received at Georgetown University. While holding a position in the U. S. Treasury Department, he employed his leisure hours in practicing dentistry as the opportunity presented, yet much of his time during those four trying years was spent in field and hospital work. Resuming his office duties after the close of the war, he soon became one of the leading practitioners of the city of Richmond, to which place he had moved his residence in 1861, his *clientèle* be-

ing composed of the leading citizens of that place. Being deeply interested in his profession he was among the first to participate in everything that looked to the elevation of dentistry. In the state dental association he was one of the leading spirits, serving as president for three successive terms.

In the making and framing of the state dental law he was a most active participant, and after the passage of the law served ten years as president of the State Board of Dental Examiners. For six years he held the position of professor of clinical surgery in the Dental Department of the Medical College of Virginia, and for four years was chairman of the dental faculty.

While thus engaged in all the activities of life, chief and uppermost with him was the obligation that he was his brother's keeper, and by his godly life and conversation he stood forth as a living epistle, known and read of all men. By his good works and deeds many will at the last day rise up and call him "blessed."

The Richmond City Dental Society, at a meeting called for the purpose, passed the following resolutions of regret:

RESOLVED, That in the removal of Dr. Moore we have indeed lost the companionship of a true and loyal friend, the counsel and advice of one who was truly prepared by long and varied experience to lead most cheerfully, as he did, those of fewer privileges, and that our society has been deprived of the services of one of its most useful members—one whose noble character entitled him to the love and admiration of all; and be it further

RESOLVED, That we tender to his family our sincerest sympathies in their great affliction, and that a copy of these resolutions be sent to the family, and to the dental journals and daily papers for publication, and that they be spread upon the minutes of this society.

DR. ALONZO H. STEVENS.

DIED, at his home on High street, Clinton, Conn., December 15, 1906, Dr. ALONZO H. STEVENS, in the sixty-eighth year of his age.

Dr. Alonzo Hiel Stevens, a son of the late Hiel Stevens, was born in Clinton, Conn., June 22, 1839. He was educated in the public schools of his native town, and before the age of twenty went to New Haven, where he entered upon the study of dentistry under the direction of a relative, Dr. Henry Stevens, who still remains a resident of that city. Soon after completing his apprenticeship he enlisted, October 26, 1862, in Company A, Twenty-seventh Regiment, C. V., and was honorably discharged from service, with other members of the company, July 25, 1863. He soon afterward entered upon the practice of dentistry in Clinton, where he remained uninterruptedly until the time of his demise.

Dr. Stevens, although not an aspirant to public office, was for several successive years a member of the town board of education. In addition to his fondness for mechanical pursuits he was a student of natural history; but in none of his avocations did his degree

of skill and ingenuity exceed that which he displayed in the work of his chosen profession, for here to the last he kept abreast of the times in every detail.

Dr. Stevens married a daughter of the late John R. Farnham of Clinton, his wife surviving him, together with three sons, John F., Alfred H., and Robert H. Stevens, all of whom are engaged in business in New York city.

DR. SAMUEL J. McDougall.

DIED, at Jamaica Plain, Mass., February 8, 1907, SAMUEL J. McDUGALL, M.D., in the seventy-seventh year of his age.

Dr. McDougall was born in Albany, N. Y., June 29, 1830. After obtaining a sound preliminary education he entered upon the study of medicine, graduating from the Albany Medical School in 1857. Shortly afterward, having been attracted to dentistry, he took up that study in Boston for a short time, eventually acquiring the practice of Dr. Kendal, a dental practitioner of that city.

Dr. McDougall was well known in medical circles throughout New England. It was largely through his efforts that the Massachusetts Dental Society was organized in May 1864. He was a member of the New England Dental Society, the Massachusetts Medical Society, and the Albany Medical Society, and at one time professor of dental therapeutics in the Boston Dental College. He retired from active practice in 1900, and soon afterward went to live with his daughter, Mrs. Arthur G. Brigham of Colorado Springs, Colo. He had, however, been making his home since April 1906 with his daughter, Mrs. Charles M. Lawrence of Jamaica Plain, Mass.

On May 2, 1860, he married Miss Elizabeth Miller of Albany, N. Y. Three daughters survive him, Mrs. Charles M. Lawrence of Jamaica Plain, Mass., Mrs. Wilmot S. Haskell of Boston, Mass., and Mrs. Arthur G. Brigham of Colorado Springs, Colo.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

May, June, and July, 1907.

MAY.

ALABAMA DENTAL ASSOCIATION. Birmingham. Four days: May 14th to 17th.
ARKANSAS STATE DENTAL ASSOCIATION. Eureka Springs. Three days: May 29th to 31st.

EASTERN INDIANA DENTAL ASSOCIATION. Anderson. Two days: May 14th and 15th.

GEORGIA STATE DENTAL SOCIETY. Atlanta. Four days: May 7th to 10th.

ILLINOIS STATE DENTAL SOCIETY. Quincy. Four days: May 14th to 17th.

IOWA STATE DENTAL SOCIETY. Cedar Rapids. Three days: May 7th to 9th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. Three days: May 20th to 22d.

LAKE ERIE DENTAL ASSOCIATION. Cambridge Springs. Three days: May 21st to 23d.

MISSISSIPPI DENTAL ASSOCIATION. Meridian. Three days: May 28th to 30th.

NEBRASKA STATE DENTAL SOCIETY. Lincoln. Three days: May 21st to 23d.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 10th and 11th.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY. Newark. May 4th.

OREGON STATE DENTAL ASSOCIATION. Portland. Three days: May 9th to 11th.

SIXTH DISTRICT (NEW YORK) DENTAL SOCIETY. Binghamton. Two days: May 2d and 3d.

SOUTH DAKOTA STATE DENTAL SOCIETY. Sioux Falls. Three days: June 4th to 6th.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION. Los Angeles. Three days: May 6th to 8th.

SOUTHERN WISCONSIN DENTAL ASSOCIATION. Lancaster. Three days: May 21st to 23d.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Scranton. Three days: May 21st to 23d.

VERMONT STATE DENTAL SOCIETY. Burlington. Three days: May 15th to 17th.

JUNE.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY. Atlantic City. Four days: June 4th to 7th.

COLORADO STATE DENTAL SOCIETY. Colorado Springs. Three days: June 20th to 22d.

FLORIDA STATE DENTAL SOCIETY. Atlantic Beach. Three days: June 6th to 8th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 11th to 13th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Three days: June 5th to 7th.

MICHIGAN STATE DENTAL ASSOCIATION. Saginaw. Two days: June 4th and 5th.

MISSOURI STATE DENTAL ASSOCIATION. Kansas City. Three days: June 4th to 6th.

NEW HAMPSHIRE DENTAL SOCIETY. Plymouth. Three days: June 25th to 27th.

SOUTH DAKOTA DENTAL SOCIETY. Sioux Falls. Three days: June 4th to 6th.

TEXAS STATE DENTAL ASSOCIATION. San Antonio. Three days: June 13th to 15th.

JULY.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Minneapolis. Three days: July 26th to 29th.

NATIONAL ASSOCIATION OF DENTAL FACILITIES. Minneapolis. July 26th.

NATIONAL DENTAL ASSOCIATION. Minneapolis. Four days: July 30th to August 2d.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 17th to 19th.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburgh. Three days: July 9th to 11th.

TENNESSEE STATE DENTAL ASSOCIATION. Knoxville. Three days: July 9th to 11th.

Examiners' Meetings.

ALABAMA BOARD OF EXAMINERS. Birmingham. May 13th.

ARKANSAS BOARD OF EXAMINERS. Eureka Springs. May 27th and 28th.

CALIFORNIA BOARD OF EXAMINERS. Los Angeles, June 10th; San Francisco, June 17th.

CONNECTICUT DENTAL COMMISSIONERS. Hartford. June 13th to 15th.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS. Washington. July 1st to 3d.

FLORIDA BOARD OF EXAMINERS. Jacksonville. June 3d.

ILLINOIS BOARD OF EXAMINERS. Chicago. June 3d.

INDIANA BOARD OF EXAMINERS. Indianapolis. June 11th to 13th.

IOWA BOARD OF EXAMINERS. Iowa City. June 6th to 11th.

KANSAS BOARD OF EXAMINERS. Topeka. May 22d to 25th.

KENTUCKY BOARD OF EXAMINERS. Louisville. June 4th.

MARYLAND BOARD OF EXAMINERS. Baltimore. May 22d and 23d.

MICHIGAN BOARD OF EXAMINERS. Ann Arbor. May 22d to 25th.

MINNESOTA BOARD OF EXAMINERS. Minneapolis. June 6th to 8th.

NEBRASKA BOARD OF EXAMINERS. Lincoln. May 29th to 31st.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 11th to 13th.

NORTH CAROLINA BOARD OF EXAMINERS. Morehead City. June 24th to 26th.

OHIO BOARD OF EXAMINERS. Columbus. June 25th to 27th.

SOUTH CAROLINA BOARD OF EXAMINERS. Anderson. June 28th.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. June 6th.

TENNESSEE BOARD OF EXAMINERS. Nashville. May 16th.

TEXAS BOARD OF EXAMINERS. San Antonio. June 10th.

VERMONT BOARD OF EXAMINERS. Montpelier. July 1st to 3d.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 11th.

WEST VIRGINIA BOARD OF EXAMINERS. Wheeling. June 12th to 14th.

WISCONSIN BOARD OF EXAMINERS. Milwaukee. June 10th.

is also to receive its final settlement at Amsterdam.

Particular attention will be devoted to a matter which after a period of comparative quiet is again agitating the minds of dental teachers and practitioners, and which concerns the education which in future should be demanded of the dentist. The question whether the dentist should above all things be a full graduate in medicine, with a knowledge, more or less complete, of dentistry superadded, or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make on him, is one which the F. D. I. has already pronounced upon in its session at Stockholm in August 1902. It cannot, however, be considered as having been definitely disposed of. It is, on the contrary, perhaps more acute at present than at any previous period in the history of our professional development.

The position of the F. D. I. having become more firmly established and its vote more authoritative, it is very desirable that its opinion should again be heard on this most important question, and every member should come prepared to give definite expression to his views.

Another point to be dealt with relates to the action of the committee of organization of the next international medical congress to be held in Budapest in 1909, in excluding from participation dentists who do not possess the medical degree. A consideration of the rights and duties of the F. D. I. in connection with the international dental congress to be held in Berlin in the same year will also take up some of the time.

These are a few of the matters which require special attention, and I sincerely hope that members will make every possible effort to be present. The steps taken toward the founding of an intellectual world-center at the Hague, if realized—and there seems to be every reason for trusting that such will be the case—will give an impulse to internationalism which will add greatly to the significance and importance of the F. D. I., and the hopes that it will be able to accomplish much in the interest of our profession and of humanity at large seem nearer fulfillment now than ever before.

W. D. MILLER, *President*.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next meeting of the *Fédération Dentaire Internationale*, to be held at Amsterdam on August 8 and 9, 1907, promises to be one of exceptional interest, as a number of questions of great importance to the federation, as well as to the whole profession, must receive thorough consideration at that time.

Our experience has brought out a number of points in the rules and regulations which require to be cleared up. The question of a pamphlet containing specific directions for the care of the teeth, presented in a form adapted to widest circulation among the poor,

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organisation.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

THE Jamestown Dental Convention will be held in a specially equipped building on the Exposition grounds which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits, and all of these will be held in it. The entrance is outside of the grounds, but access to the grounds may be obtained through it. The building is wired with both direct and alternating current, equipped with running water, is well lighted, and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce bldg., Norfolk, Va. To him exhibitors should apply at once for space—price per foot and a plan of the hall will be sent upon request.

The clinics at the convention are under the supervision and direct control of Dr. C. J. Grievies, Park and Madison aves., Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each state in the Union and near countries, viz, Canada, Mexico, Cuba, and Hawaii. From these come reports of the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen are given with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace st., Richmond, Va., who reports memberships rapidly coming in.

The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. Later reports as to hotel accommodations and prices will appear in a subsequent issue.

The membership fee is five dollars, which will entitle members to receive a bound copy of the proceedings. A half-rate—\$2.50—is made to *bona fide* dental students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee for indorsement and acceptance will entitle them to the rights and privileges of the convention.

The essayists are to be Prof. W. D. Miller of Berlin, Germany, "Demonstration of Preparations Relating to the Wasting (so-called Erosion) of the Teeth"; Dr. F. T. Van Woert of Brooklyn, N. Y., "Is the Cemented Filling the Filling of the Future?" Dr. Chas. L. Alexander of Charlotte, N. C., "Gold Inlays," and Dr. R. Ottolengui of New York city, "The Angle Method in Orthodontia."

Dr. E. P. Beadles was elected by the Committee on Organization in February to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention.

The following officers were elected by the Committee of Organization at its recent meeting, February 23, 1907.

Officers.

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-president—Dr. B. Holly Smith, Baltimore, Md.

Secretary-general—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

Vice-presidents—Chas. L. Alexander, Charlotte, N. C. R. R. Andrews, Cambridge, Mass. Waldo E. Boardman, Boston, Mass. Wm. M. Bebb, Los Angeles, Cal. G. V. Black, Chicago, Ill. Edwin C. Blaisdell, Portsmouth, N. H. F. A. Blanchard, Marksville, La. George W. Boynton, Washington, D. C. Truman W. Brophy, Chicago, Ill. Geo. V. I. Brown, Milwaukee, Wis. H. J. Burkhardt, Batavia, N. Y. Chas. S. Butler, Buffalo, N. Y. Wm. Carr, New York, N. Y. Arthur W. Chance, Portland, Ore. Norris R. Cox, Portland, Ore. Wm. Crenshaw, Atlanta, Ga. W. A. Cudworth, Milwaukee, Wis. L. E. Custer, Dayton, Ohio. W. G. Dalrymple, Ogden, Mo. Edwin T. Darby, Philadelphia, Pa. John W. David, Corsicana, Tex. A. J. Derby, Honolulu, Hawaii. Max M. Eble, Louisville, Ky. Edward Eggleston, Richmond, Va. L. C. Elkins, St. Augustine, Fla. W. Leon Ellerbeck, Salt Lake City, Utah. W. W. Evans, Washington, D. C. J. Falero, City of Mexico, Mex. Geo. L. Field, Detroit, Mich. Ricardo Figueroa, City of Mexico, Mex. R. D. Griffin, Paris, Tex. Chas. L. Gunn, Gadsden, Ala. J. A. Hall, Collinsville, Ala. T. M. Hampton, Helena, Mont. Geo. Edwin Hunt, Indianapolis, Ind. Chas. F. Irwin, Vancouver, Washington. S. H. Johns, Wilmington, Del. H. H. Johnson, Macon, Ga. S. F. Kemp, Key West, Fla. H. F. King, Fremont, N. H. Edward C. Kirk, Philadelphia, Pa. D. O. M. LeCron, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa. Geo. E. Longeway, Gt. Falls, Mont. A. A. McClanahan, Springfield, Tenn. T. T. McClanahan, Nashville, Tenn. A. C. McCurdy, Towson, Md. L. B. McLaurin, Natchez, Miss. James McManus, Hartford, Conn. D. J. McMillen, Kansas City, Mo. W. G. Mason, Tampa, Fla. Chas. A. Meeker, Newark, N. J. A. S. Melendy, Knoxville, Tenn. T. M. Milam, Little Rock, Ark. J. H. E. Milhous, Blackville, S. C. W. D. Miller, Berlin, Ger. Geo. E. Mitchell, Haverhill, Mass. T. T. Moore, Columbia, S. C. Garrett Newkirk, Pasadena, Cal. L. G. Noel, Nashville, Tenn. W. E. Norris, Charlottesville, Va. J. R. Osborne, Shelby, N. C. R. Ottolengui, New York, N. Y. F. A. Shotwell, Rogersville, Tenn. J. D. Patterson, Kansas City, Mo. A. H. Peck, Chicago, Ill. R. W. Quarles, Van Buren, Ark. H. C. Register, Philadelphia, Pa. D. N. Rust, Washington, D. C. R. M. Sanger, Orange, N. J. A. C. Searl, Owatonna, Minn. Alton

H. Thompson, Topeka, Kans. Pitt S. Turner, Belton, Tex. Geo. S. Vann, Gadsden, Ala. F. T. Van Woert, Brooklyn, N. Y. Andreas C. Weber, Havana, Cuba. E. K. Wedelstaedt, St. Paul, Minn. Geo. H. Wilson, Cleveland, Ohio. John E. Woodward, New Orleans, La. C. M. Work, Ottumwa, Iowa.

Clinics.

General Clinic Committee. Clarence J. Grieves (chairman), Park and Madison aves., Baltimore, Md. Baskerville Bridgeforth, Richmond, Va. E. J. Tucker, Roxboro, N. C. H. Herbert Johnson, Macon, Ga. F. A. Bowles, Washington, D. C. Joseph T. Meadors, Nashville, Tenn.

STATE CHAIRMEN FOR CLINICS.

Alabama. L. A. Crumly, Hood bldg., Birmingham.
Arkansas. Chas. Richardson, Fayetteville.
California. Frank L. Platt, 712 Steiner st., San Francisco.
Connecticut. Chas. McManus, 80 Pratt st., Hartford.
Colorado. W. E. Sinton, El Paso bldg., Colorado Springs.
Delaware. C. R. Jeffries, New Century bldg., Wilmington.
District of Columbia. H. J. Allen, 303-04 Colorado bldg., Washington.
Florida. Carroll H. Frink, Fernandina.
Georgia. A. M. Jackson, Macon.
Idaho. J. B. Burns, Payette.
Indian Territory—S. E. Long, South McAlester.
Indiana. Carl D. Lucas, Willoughby bldg., Indianapolis.
Iowa. C. M. Work, Ottumwa.
Kansas. Frank O. Hetrick, Ottawa.
Kentucky. E. D. Rose, Bowling Green.
Louisiana. Jules J. Sarrazin, New Orleans.
Maine. H. A. Kelley, 609 Congress st., Portland.
Maryland. George E. Hardy, Baltimore.
Michigan. E. B. Spalding, 4 Adams ave., West Detroit.
Massachusetts. C. W. Rodgers, Dorchester.
Minnesota. J. W. S. Gallagher, Winona.
Mississippi. W. R. Wright, Jackson.
Missouri. E. P. Dameron, DeMenil bldg., St. Louis.
Montana. G. E. Longeway, Great Falls.
Nebraska. H. A. Shannon, Lincoln.
Nevada. J. C. Hennessy, Reno.

New Hampshire. John W. Worthen, Concord.

New Jersey. C. W. F. Holbrook, 2 Saybrook place, Newark.

New York. Wm. Dwight Tracy, New York.

North Carolina. J. A. Gorman, Asheville.

North Dakota. C. L. Rose, Fargo.

Ohio. H. C. Brown, 185 E. State st., Columbus.

Oklahoma. Theodore P. Bringhurst, Shawnee.

Oregon. Arthur W. Chance, Dekum bldg., Portland.

Pennsylvania. H. B. McFadden, 3505 Hamilton ave., Philadelphia.

Rhode Island. Dennis F. Keefe, 315 Butler Exchange, Providence.

South Carolina. Thomas T. Moore, Jr., Columbia.

South Dakota. E. S. O'Neil, Canton.

Tennessee. A. J. Cottrell, Knoxville.

Texas. John W. David, Corsicana.

Utah. William Leon Ellerbeck, 21 Hooper bldg., Salt Lake City.

Vermont. E. O. Blanchard, Randolph.

Virginia. R. L. Simpson, Richmond.

Washington. C. A. Custer, Chapin block, Seattle.

West Virginia. F. L. Wright, Wheeling.

Wisconsin. W. A. Cudworth, Milwaukee.

Mexico. J. Falero, 18 Tacuba, City of Mexico.

Cuba. Andres G. Weber, Corales 1 Esquina Egido, Havana.

Hawaii. A. J. Derby, Honolulu.

Membership.

General Membership Committee. F. W. Stiff (chairman), 600 East Grace st., Richmond, Va. A. S. Melendy, Knoxville, Tenn. Wm. Crenshaw, Atlanta, Ga. M. S. Merchant, Mason bldg., Houston, Tex.

STATE CHAIRMEN FOR MEMBERSHIP.

Alabama. C. S. Gunn, Gadsden.

Arkansas. T. M. Milam, Mann bldg., Little Rock.

California. J. Lorenz Pease, Oakland.

Connecticut. Frederick T. Murlless, Jr., Windsor Locks.

Colorado. Henry F. Hoffman, 612 California bldg., Denver.

Delaware. S. H. Johns, Wilmington.

District of Columbia. Wm. N. Cogan, Washington.

Florida. F. E. Buck, Jacksonville.

Georgia. Walter G. Miller, Augusta.

Idaho. J. H. Lewis, Nez Perce.

Illinois. Frederick B. Noyes, Stewart bldg., Chicago.

Indiana. Frederick R. Henshaw, Middletown.

Indian Territory. J. M. Staples, Atoka.

Iowa. F. T. Breene, Iowa City.

Kansas. F. C. Corey, Council Grove.

Kentucky. A. B. Dixon, Glasgow.

Louisiana. C. Victor Vignes, Machee bldg., New Orleans.

Maine. Will S. Payson, Castine.

Maryland. W. C. Foster, 9 West Franklin st., Baltimore.

Massachusetts. Waldo E. Boardman, 419 Boylston st., Boston.

Michigan. Albert L. LeGro, 271 Woodward ave., Detroit.

Minnesota. James Elmer Weirick, St. Paul.

Mississippi. A. E. Tillman, Vicksburg.

Missouri. D. O. M. Le Cron, Mo. Trust bldg., St. Louis.

Montana. T. M. Hampton, Helena.

New Jersey. Alphonso Irwin, Camden.

Nebraska. E. H. Bruening, Omaha.

New Hampshire. H. P. Baldwin, Manchester.

New York. H. Clay Ferris, 1166 Dean St., Brooklyn.

North Carolina. C. A. Bland, Charlotte.

Ohio. L. P. Bethel, Columbus.

Oklahoma. G. L. White, Oklahoma City.

Oregon. George H. Nottage, Portland.

Pennsylvania. Howard E. Roberts, 1517 Locust st., Philadelphia.

Rhode Island. Albert L. Midgley, 312 Butler Exchange, Providence.

South Carolina. L. P. Dotterer, Charleston.

South Dakota. G. W. Collins, Vermillion.

Tennessee. Justin D. Townner, Memphis.

Texas. Rufus W. Carroll, Beaumont.

Utah. W. G. Dalrymple, Ogden.

Vermont. K. L. Cleaves, Montpelier.

Virginia. Wm. Pilcher, Petersburg.

Washington. F. J. Shaw, Burke block, Seattle.

West Virginia. Chas. H. Bartlett, Parkersburg.

Wisconsin. W. H. Mueller, Madison.

Mexico. Ricardo Figueroa, 1 Calle de Santo Domingo 8, City of Mexico.

Canada. Theodore C. Trigger, St. Thomas, Ontario.

Hawaii. E. L. Hutchinson, Honolulu.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

FOLLOWING is the program of the American Medical Association—Section on Stomatology, for its annual meeting at Atlantic City, N. J. June 4 to 7, 1907:

1. Chairman's Address. M. I. Schamberg, New York city.
2. "The Necessity of a Medical Education for Dentists."
 - (a) "From the Standpoint of the Lay Public." M. L. Rhein, New York city, H. C. Registrar, Philadelphia, and James McManus, Hartford, Conn.
 - (b) "From the Standpoint of the Physician." V. A. Latham, Chicago.
3. "The Common Ground of Dentistry and Medicine." F. L. Fossum, New York city.
4. "The Mutual Development Dependence of the Upper Air-Tract, the Jaws, the Teeth, and the Face; and their Economic Importance to the Human Race." W. Sohler Bryant, New York city.
5. "The Relation of Upper Respiratory Obstruction to Oral Deformity. Simultaneous Treatment by Expansion of the Dental Arch." Francis A. Faught, Philadelphia.
6. "Speech Results of Cleft Palate Operations." George V. I. Brown, Milwaukee.
7. "Technique of Lip and Palate Operations." Thomas Fillebrown, Boston.
8. "False Statements Concerning Causes of Pathological Conditions." S. B. Luckie, Chester, Pa.
9. "Acid Auto-intoxication; the Principal Cause of Erosion and Abrasion." Eugene S. Talbot, Chicago.
10. "Some Results from Orthodontia on the Deciduous Teeth." E. A. Bogue, New York city.
11. "Osteomyelitis of the Maxilla." Samuel L. Goldsmith, New York city.
12. "A Case of Epidermoid Carcinoma of the Inferior Maxilla." W. H. Potter, Boston.
13. "Pregnancy: a Factor in the Etiology of Dental Diseases." James E. Power, Providence, R. I.
14. "The Dentist in the United States Navy." Richard Grady, Annapolis.

15. "The X Ray an Aid to the Stomatologist." R. G. Richter, Milwaukee.
16. "Radiography in Oral Surgery, with Demonstrations of a Focus Finder and Ray Localizer." G. E. Pfahler, Philadelphia.

M. I. SCHAMBERG, *Chairman*.
EUGENE S. TALBOT, *Sec'y*.

NATIONAL DENTAL ASSOCIATION.

THE eleventh annual session of this association will be held in Minneapolis, July 30 and 31, and August 1 and 2, 1907, when a full program of essays, demonstrations, and clinics will be presented. Reduced rates on all railways and at hotels will be secured. The largest meeting in the history of the association is confidently expected. Full program in July journals.

The following are the officers of the sections and chairmen of clinics and local arrangements:

SECTION I:

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

D. O. M. LE CRON (chairman), Missouri Trust bldg., St. Louis, Mo.

W. G. MASON (vice-chairman), Tampa, Fla.

E. P. DAMERON (secretary), 58 De Menil bldg., St. Louis, Mo.

SECTION II:

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

WM. CRENSHAW (chairman), 621 Prudential bldg., Atlanta, Ga.

JOHN I. HART (vice-chairman), 118 W. Fifty-sixth st., New York city.

J. J. SARRAZIN (secretary), Godchaux bldg., New Orleans, La.

SECTION III:

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR (chairman), 35 W. Forty-sixth st., New York city.

W. H. G. LOGAN (vice-chairman), 785 Winthrop ave., Chicago, Ill.

M. L. RHEIN (secretary), 38 E. Sixty-first st., New York city.

CLINICS.

E. K. WEDELSTAEDT (chairman), 204 New York Life bldg., St. Paul, Minn.

SECTION ON INLAYS.

WALTER N. MURRAY (chairman), 601 Medical blk., Minneapolis, Minn.

LOCAL COMMITTEE OF ARRANGEMENTS.

F. B. KREMER (chairman), Masonic Temple, Minneapolis, Minn.

Delegates received only from state societies, but a cordial invitation is extended to all reputable practitioners to attend the meeting.

C. S. BUTLER, *Sec'y*,
267 Elmwood ave., Buffalo, N. Y.

A. H. PECK, *President*,
92 State st., Chicago, Ill.

Clinic Section.

THERE is every indication that there will be a large clinic held in Minneapolis on July 31st and August 1st. Many men have signified their intention to be present and take part in either the operative work, or else give some kind of a table clinic. If I am to judge from what has been written to me, we shall have a most interesting meeting, so far as the clinic is concerned.

In the past there has been some criticism regarding the clinic room being so far away from headquarters. In no sense of the word is the Clinic Committee to be blamed for this condition of affairs. It must take what is offered, or else not have clinical demonstrations. Now, this year there is every assurance that this condition will be materially changed. Dr. F. B. Kremer, the chairman of the Local Committee of Arrangements, is a man of much experience in dental society work—therefore he is the very man for the place. He knows what is desired, and beyond question he will secure a hall for the clinic room in close proximity to headquarters. This year, at least, those contemplating being with us need not worry about this special part of the meeting, for Dr. Kremer is a man who does not neglect anything.

From reports which are constantly being received there is every reason to believe that we shall hold a most successful clinic.

The following gentlemen are acting as district and state chairmen:

DISTRICT AND STATE CHAIRMEN.

New England States. Dr. G. E. Savage, Worcester, Mass.

New York. Dr. F. L. Fossum, N. Y.

New Jersey, Delaware, and District of Columbia. Dr. M. F. Finley, Washington, D. C.

Maryland. Dr. C. M. Gingrich, Baltimore, Md.

Virginia and West Virginia. Dr. F. W. Stiff, Richmond, Va.

North and South Carolina and Georgia. Dr. H. H. Johnson, Macon, Ga.

Florida, Alabama, and Mississippi. Dr. A. T. Reeves, Selma, Ala.

Tennessee and Kentucky. Dr. W. M. Slack, Memphis, Tenn.

Pennsylvania. Dr. H. E. Friesell, Pittsburgh.

Ohio. Dr. H. C. Brown, Columbus.

Indiana. Dr. C. D. Lucas, Indianapolis.

Illinois. Dr. F. W. Gethro, Chicago.

Wisconsin. Dr. S. H. Chase, Madison.

Ontario.

Manitoba. Dr. K. C. Campbell, Winnipeg.

It is not an easy matter to arrange the program, and I shall be grateful to all the chairmen for their list of clinicians. The earlier the list is sent the better.

E. K. WEDELSTAEDT, *Ch'man Clinic Section*,
N. Y. Life bldg., St. Paul, Minn.

NATIONAL ASSOCIATION OF
DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the European plan. Any room in the hotel is capable of accommodating two people. All the rooms have telephone connection, and hot and cold water. Railroad rates will be given later.

The Committee on Colleges, Joint Confer-

ence Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,
29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in Minneapolis, Minn., commencing at 2 P.M., Friday, July 26, 1907.

The Executive Committee will meet at 10 A.M. the same day. The West Hotel has been selected as headquarters and place of meeting. Hotel rates as published in the notices of the meeting of the National Association of Dental Examiners will prevail.

H. B. TILESTON, *Ch'man Ex. Committee*,
B. HOLLY SMITH, *Sec'y Ex. Committee*,
1007 Madison ave., Baltimore, Md.

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompret, general secretary; Dr. Gires, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Subscriptions and communications should be addressed to

DR. CHOMPRET, *General Sec'y*,
182 rue de Rivoli, Paris.

ST. LOUIS DENTAL COLLEGE.

ALUMNI CLINIC.

THE Alumni Association of the St. Louis Dental College (formerly Marion-Sims) wish to announce that their annual clinic will be

held at the college building, Grand ave. and Caroline st., on Tuesday and Wednesday, May 7 and 8, 1907.

All ethical members of the profession are cordially invited to come and enjoy the festival of good things being prepared, and every member of the alumni is especially requested to show his allegiance to the association by his presence.

JOHN BERNARD O'BRIEN,
W. L. O'NEILL,
Committee on Publicity.

UNIVERSITY OF PENNSYLVANIA.

DENTAL ALUMNI SOCIETY.

THE twenty-seventh annual meeting of the Dental Alumni Society of the University of Pennsylvania will be held in Philadelphia, June 15, 17, and 18, 1907. This will be an extremely interesting meeting, the number of clinics and social features being unusually large.

PROGRAM.

Saturday, June 15th—3 P.M. Aquatic sports in the gymnasium pool: races, water-polo, and fancy swimming.

4 P.M. "Varsity" baseball team vs. graduates, Franklin Field; admission free.

6 P.M. Alumni supper, Weightman Hall gymnasium.

7.45 P.M. Annual business meeting, General Alumni Society, Weightman Hall.

8 P.M. Reception to wives of alumni, Houston Hall and adjoining campus.

8.30 P.M. Reunion of classes in the dormitory triangle and lighting of the Bonfire. Special quarters for alumni of the dental department.

Monday, June 17th—10 A.M. Clinics and demonstrations, Dental Hall, both morning and afternoon.

7 P.M. The twenty-seventh anniversary banquet, Dental Alumni Society at the Bartram.

Tuesday, June 18th—10 A.M. Annual business meeting, Dental Hall.

2 P.M. University grounds and buildings open for inspection.

There will be special rates on all railroads. For further information, address,

VICTOR COCHRAN, *Sec'y*,
1628 N. Seventeenth st., Phila.

PHILADELPHIA DENTAL COLLEGE.

ALUMNI SOCIETY MEETING.

THE Alumni Society of the Philadelphia Dental College will celebrate Alumni Day, Friday, May 31, 1907, in the college buildings at Eighteenth and Buttonwood sts., Philadelphia, Pa. The dental profession is cordially invited to be present.

At 10 A.M. a series of clinics will be given under the auspices of the clinic committee, composed of Dr. C. R. Jefferis, chairman, Drs. Max Greenbaum and W. G. Chase.

At 2.30 P.M. the business meeting will be held in the amphitheater of the college, which will be presided over by Dr. Wm. T. Wyckoff. After Dr. Wyckoff has delivered the presidential address, Dr. L. A. O'Brian of New York city will read the annual paper. The discussion of this paper will then ensue. The faculty will present some very interesting dental topics, and make college announcements.

The alumni banquet will occur Friday evening, May 31st. An announcement of the time, place, and cost per cover will be made later on. The banquet committee, consisting of Dr. W. G. Chase, chairman, Drs. M. F. Quinn, and Harvey Iredell, have full charge, and applications should be made to them for covers. The faculty, trustees, students, graduating class, and alumni will be warmly welcomed at the banquet.

An unusual feature of Alumni Day is the fact that it is the last to be held under the old *régime*. This year the Philadelphia Dental College enters into a federation with Temple College. Dr. Russell H. Conwell will be president of the new board of trustees. There will also be a new secretary and treasurer, but Dr. Leo Greenbaum remains dean, and the faculty continue the same.

ALPHONSO IRWIN, *Sec'y*.

WASHINGTON UNIVERSITY DENTAL DEPARTMENT.

MEETING OF ALUMNI.

A MEETING of the Alumni Association of Washington University Dental Department (Missouri Dental College) will be held May 20 and 21, 1907, at the college building, 2645 Locust st., St. Louis, Mo.

A number of prominent essayists and clini-

cians have been secured, and an interesting and instructive program will be presented. Adequate space has been secured for the various manufacturers' exhibits; this will be a noteworthy feature of the meeting. All ethical practitioners are invited.

A. J. PROSSER, *Chairman*,
F. W. HORSTMANN,
CHAS. HERBERT.

UNIVERSITY OF PENNSYLVANIA, DENTAL DEPARTMENT.

CLASS OF 1902.

THE fifth annual reunion of the class of 1902, Dental Department of the University of Pennsylvania, will be held on Alumni Day, Saturday, June 15, 1907. All are earnestly requested to make an effort to come back to their alma mater on that day.

J. ARTHUR STANDEN, *Sec'y*,
1220 Locust st., Philadelphia. Pa.

DETROIT DENTAL COLLEGE.

ALUMNI CLINIC AND BANQUET.

THE sixteenth annual commencement exercises of the Department of Dental Surgery of the Detroit College of Medicine will be celebrated on May 30, 1907, with an elaborate clinical program and banquet. All reputable practitioners are invited.

P. J. O'REILLY,
Detroit, Mich.

OREGON STATE DENTAL ASSOCIATION.

At the last meeting of the Executive Committee of the Oregon State Dental Association, it was decided to hold the annual meeting in Portland, Ore., May 9, 10, and 11, 1907.

JEAN CLINE, *Sec'y-Treasurer*,
Portland, Ore.

GEORGIA STATE DENTAL SOCIETY.

THE next annual meeting of the Georgia State Dental Society will be held in Atlanta, May 7, 8, 9, and 10, 1907. All ethical practitioners are cordially invited to attend.

D. H. MCNEILL, *Cor. Sec'y*,
Athens, Ga.

KENTUCKY STATE DENTAL ASSOCIATION.

THE next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21, and 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession.

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE tenth annual session of the Southern California Dental Association will be held in Los Angeles, May 6, 7, and 8, 1907, at the same time that the Imperial Council of Mystic Shrine meets here, and all members of the dental profession contemplating visiting southern California at that time will confer a favor upon the association by notifying

CHAS. M. BENBROOK, *Sec'y*,
455 S. Broadway, Los Angeles, Cal.

NEBRASKA STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Nebraska State Dental Society will be held in Lincoln, May 21, 22, and 23, 1907, at the Lincoln Dental College. The Lindell Hotel will be headquarters. All reputable members of the profession are invited to attend.

M. E. VANCE, *Sec'y*,
Lincoln, Nebr.

VERMONT STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., May 15, 16, and 17, 1907.

The society has in the past held most successful meetings, and we have every reason to expect that this will surpass any previous one, as a very interesting program has been prepared by the committee, and will be mailed in due time. Vermont has the largest per cent. of membership in its state society of any state in New England, and we hope to see every dentist in the state who is eligible a member.

THOMAS MOUND, *Sec'y*,
Rutland, Vt.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the New York State Dental Society will be held at Hotel Ten Eyck, Albany, May 10 and 11, 1907, convening promptly at 10 o'clock on the morning of the first day, at which time the president desires to see every member present. A program of reports and essays of unusual interest will be presented, and on Saturday afternoon a large number of special chair and table clinics will be given. A cordial invitation is extended to all reputable practitioners to attend the sessions.

PROGRAM.

Dr. W. A. White, President's Address.

Dr. A. H. Peck, Chicago, "The Value of Association."

Dr. Clarence J. Grieves, Baltimore, "The Soldered Porcelain Facing Checked: Causes and Remedies." Illustrated.

Dr. Eugene Talbot, Chicago, "Acid Auto-intoxication and Systemic Diseases the Cause of Erosion and Abrasion."

Dr. L. C. F. Hugo, Washington, "Preparing Dental Papers."

Dr. G. V. I. Brown, Milwaukee, "Oral Surgical Lessons." Illustrated.

Dr. Chas. McManus, Hartford, "Pierre Fauchard." Illustrated.

Dr. Nelson T. Shields, New York city, "Treatment and Filling of Root-canals."

Dr. I. C. Curtis, Fulton, N. Y., "Fifty Years of Dental Science, with its Fads and Foibles."

Dr. S. L. Goldsmith, New York city, Report of the Correspondent.

Dr. E. Howard Babcock, Brooklyn, Report of the Committee on Practice.

Dr. Emanuel Muntz, Buffalo, Report of the Committee on Scientific Research: "Saliva Sulfocyanate Test."

There will be an interesting exhibit of dental appliances and supplies by the leading dealers in the country. For any information regarding exhibits, address Dr. J. L. Appleton, 89 Columbia ave., Albany, N. Y.

A railway rate of a fare and one-third, on the certificate plan, for those attending the meeting will be secured. Tickets at full fare for the going journey may be purchased within three days previous to and during the first day of the meeting. Be sure, when pur-

chasing ticket, to request a certificate. On arrival at the meeting, present the certificate, with twenty-five cents, to the secretary, Dr. C. S. Butler.

Tickets good returning not later than May 15th.

W. A. WHITE, *President*.

CHAS. S. BUTLER, *Sec'y*,
Buffalo, N. Y.

SIXTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Sixth District Dental Society of the state of New York will be held at the Hotel Bennett, Binghamton, N. Y., Thursday and Friday, May 2 and 3, 1907. Cross off these dates now.

FRED FORD, *Sec'y*,
Cazenovia, N. Y.

IOWA STATE DENTAL SOCIETY.

THE forty-fifth annual meeting of the Iowa State Dental Society will be held at Cedar Rapids, Iowa, May 7, 8, and 9, 1907. A good program is being arranged for. A cordial invitation is extended to the profession.

C. L. TOPLIFF, *Sec'y*,
Decorah, Ia.

EASTERN INDIANA DENTAL ASSOCIATION.

THE Eastern Indiana Dental Association will meet in Anderson, Ind., May 14 and 15, 1907. Good clinics, good papers. Everybody invited. Everybody who comes is a member.

C. W. ORLAND,
Anderson, Ind.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY.

THE regular monthly meeting of the Odontotechnique Society of New Jersey will be held at Achtel-Stetter's, Newark, N. J., on Saturday evening, May 4, 1907. The paper of the evening will be read by D. A. Webb, M.D., of Scranton, Pa., president of the Scranton Clinical and Pathological Society—subject, "Diseases of the Jaws: Malignant Growths, Fractures, etc."

H. J. GIBBINS,
Newark, N. J.

ILLINOIS STATE DENTAL SOCIETY.

THE forty-third annual meeting of the Illinois State Dental Society will be held at Quincy, on Tuesday, Wednesday, Thursday, and Friday, May 14, 15, 16, and 17, 1907.

ARTHUR D. BLACK, *Sec'y*,
31 Washington st., Chicago.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Southern Wisconsin Dental Association will be held at Lancaster, Wis., May 21, 22, and 23, 1907. All reputable practitioners are cordially invited.

C. W. COLLVER, *Sec'y*,
Clinton, Wis.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association will hold its annual meeting at Eureka Springs, Ark., May 29, 30, and 31, 1907.

HENRY P. HOPKINS, *Sec'y-Treas.*,
Argenta, Ark.

LAKE ERIE DENTAL ASSOCIATION.

THE forty-fourth annual meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., on May 21, 22, and 23, 1907.

Upon our program this year are men of exceptional merit, and we are pleased to invite all reputable dentists and their friends to this beautiful place for convention purposes.

V. H. MCALPIN, *Sec'y*,
Warren, Pa.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

THE Susquehanna Dental Association of Pennsylvania will convene in Scranton, at Saint Luke's Parish House, for its forty-fourth annual meeting, on Tuesday, Wednesday, and Thursday, May 21, 22, and 23, 1907.

A large number of papers and clinics has been secured from many prominent members of the profession in New York state and Philadelphia, as well as from our own members

The largest manufacturers' exhibit ever held by this society has also been secured. Non-members desiring a copy of the program are requested to communicate with the secretary.

An afternoon and evening will be devoted to an outing at Moosic Lake, a near-by mountain resort, with an altitude of 2000 feet.

A cordial invitation is extended to all ethical practitioners.

EDMOND J. DONNEGAN, *Recording Sec'y*,
22 Amsden bldg., Scranton, Pa.

ALABAMA DENTAL ASSOCIATION.

THE next annual meeting of the Alabama Dental Association will be held in Birmingham, Ala., May 14 to 17, 1907. Reduced rates on all railroads. All ethical dentists are invited to attend.

F. A. JOHNSTON, *Sec'y*, Sheffield, Ala.

MISSISSIPPI DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Mississippi Dental Association will convene in the county court-house in Meridian, May 28, 29, and 30, 1907. All ethical practitioners of this and other states are cordially invited to attend. Reduced railroad rates and reduced hotel accommodations will be secured.

For full particulars, address

E. DOUGLAS HOOD, *Sec'y*, Tupelo, Miss.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its meeting in the city of San Antonio, June 13, 14, and 15, 1907.

G. W. STAPLES, *Sec'y*, Dallas, Tex.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, and 13, 1907. The Executive Committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, *Sec'y*,
Indianapolis, Ind.

MICHIGAN STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE annual meeting of the Michigan State Dental Association will be held in Saginaw, June 4 and 5, 1907. All ethical practitioners are cordially invited to attend.

L. N. HOGARTH, *Sec'y*, Detroit, Mich.

NEW HAMPSHIRE DENTAL SOCIETY.

THE annual meeting of the New Hampshire Dental Society will be held at Plymouth, N. H., June 25, 26, and 27, 1907, beginning on the evening of the 25th. All members of the profession are cordially invited to be present.

FRED F. FISHER, *Sec'y*, Manchester, N. H.

SOUTH DAKOTA DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE twenty-fifth annual meeting of the South Dakota Dental Society will be held at Sioux Falls, June 4, 5, and 6, 1907.

A most interesting program has been arranged, and we want to see the largest attendance the society has ever had. A larger membership is desired, and every eligible dentist in the state should become a member. Dentists of southeastern Minnesota and northwestern Iowa are specially invited.

FERDINAND BROWN, *Sec'y*, Sioux Falls.

MASSACHUSETTS DENTAL SOCIETY.

THE forty-third annual meeting of the Massachusetts Dental Society will be held in the Mechanic Association bldg., Huntington ave., Boston, Mass., June 5, 6, and 7, 1907.

An excellent program has been arranged by the Executive Committee. It will consist of essays, reports of special committees, clinics, and a large exhibit of dental and medical supplies. Special committees will report on the following interesting subjects: Tuberculosis and other preventable diseases, dental education, dental supplies, dental medicine, dental research, and dental hospitals. Gentlemen practicing dentistry in Massachusetts are invited to join the society.

CHARLES W. RODGERS, *Sec'y*,
165 Howard st., Dorchester, Mass.

FLORIDA STATE DENTAL SOCIETY.

THE twenty-fourth annual meeting of the Florida State Dental Society will be held in the ballroom of the Hotel Continental, at Atlantic Beach, Thursday, June 6, 1907, continuing in session three days. All ethical practitioners of dentistry are cordially invited to attend.

CARROLL H. FRINK, *Cor. Sec'y*,
Fernandina, Fla.

MISSOURI STATE DENTAL ASSOCIATION.

THE next annual meeting of the Missouri State Dental Association will convene in Kansas City, Mo., June 4, 5, and 6, 1907. A most interesting and profitable meeting is anticipated. All ethical members of the profession are cordially invited to attend.

E. P. DAMERON, *Cor. Sec'y*,
St. Louis, Mo.

COLORADO STATE DENTAL SOCIETY.

THE annual meeting of the Colorado State Dental Society will be held at Colorado Springs, June 20, 21, and 22, 1907. A good program is being arranged and a profitable meeting is assured. An invitation to attend is extended to all ethical dentists, and special efforts will be put forth to make it pleasant for visitors from other states.

The undersigned would be pleased to hear from any who may plan to attend the meeting.

I. C. BROWNIE, *Ch'm Exec. Com.*,
404 California bldg., Denver, Colo.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing 10 A.M. July 17th and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, at the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st.

Prominent dentists have signified their intention of reading papers, and the clinics will all be of a new and novel nature. Clinic

committee in charge of Charles H. Dilt, Trenton, N. J.; exhibit committee in charge of Walter Woolsey, Elizabeth, N. J. Programs will be out June 15th.

Last year over eight hundred dentists registered in attendance. The Auditorium where the meeting is held is the largest and best adapted building on the Jersey coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its thirty-ninth annual meeting on July 9, 10, and 11, 1907, at the Schenley Hotel, Pittsburg, Pa.

LUTHER M. WEAVER, *Sec'y*,
Philadelphia, Pa.

TENNESSEE STATE DENTAL ASSOCIATION.

THE fortieth annual meeting of the Tennessee State Dental Association will be held at Knoxville, Tenn., July 9, 10, and 11, 1907. All are cordially invited. Reduced railroad rates will be secured, and a successful meeting is anticipated.

R. J. MCGAVOCK, *Sec'y*,
Columbia, Tenn.

NEBRASKA BOARD OF EXAMINERS.

THE next meeting of the Nebraska Board of Dental Examiners will be held at the State-house, in Lincoln, Nebr., May 29, 30, and 31, 1907. All applicants for examination must have their applications in the hands of the secretary five days before this date.

For further information address.

C. F. LADD, *Sec'y*,
1241 O. st., Lincoln, Nebr.

MICHIGAN BOARD OF EXAMINERS.

THE Michigan Board of Examiners in Dentistry will hold their next meeting for the examination of candidates at the dental department of the University of Michigan, at Ann Arbor, May 22, 23, 24, and 25, 1907.

E. A. HONEY, *Sec'y*,
Kalamazoo, Mich.

ARKANSAS BOARD OF EXAMINERS.

THE Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, Ark., May 27 and 28, 1907.

A. T. McMILLIN, *Sec'y*,
Little Rock, Ark.

MARYLAND BOARD OF EXAMINERS.

THE regular semi-annual meeting of the Maryland State Board of Dental Examiners for the examination of candidates for certificates will be held May 22 and 23, 1907, at the Baltimore College of Dental Surgery, Baltimore, at 9 A.M. Application blanks and full information will be furnished by

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

TENNESSEE BOARD OF EXAMINERS.

EXAMINATION UNDER AMENDED DENTAL LAW.

THE Tennessee Dental Law has been recently so amended as to require all applicants for registration to be graduates of reputable dental colleges, and they must also pass a written examination by the State Board, and give a practical demonstration of proficiency in operative and prosthetic dentistry. Examination fee, \$10.00. The board will hold its annual meeting at Nashville, May 16, 1907.

With the other important amendments made at the same time, the Tennessee dental law is now on a par with the dental laws of other states.

F. A. SHOTWELL, *Sec'y*,
Rogersville, Tenn.

ALABAMA BOARD OF EXAMINERS.

THE Board of Dental Examiners for the State of Alabama will meet in Birmingham, Ala., on the Monday before the second Tuesday in May 1907. In addition to the regular written examination, each applicant must fill at least two teeth—approximal cavities—one with gold, the other with alloy, work to be done under the immediate supervision of the board. The board will determine or pass on suitable selections of cavities, and will try to furnish subjects, but, it failing to do so, applicants for license must find or bring

their own subjects, also instruments and materials.

Each applicant must take or have taken an impression of his own mouth. Make a plaster cast of the same, cut from the cast the six anterior teeth, and make a bridge for same with porcelain facings. Cast can be made and facings fitted before the examination, but the backings must be put on and the facings arranged, also invested and soldered, under the supervision of the board, hard solder being required.

THOS. P. WHITBY, *Sec'y*,
Selma, Ala.

KANSAS BOARD OF EXAM- INERS.

THE Kansas State Board of Dental Examiners will hold their next meeting for examination in Topeka, May 22, 23, 24, and 25, 1907, at the Copeland Hotel annex. The examination fee will be \$25.00, with an additional fee of \$5.00 for a license. Examination will not be necessary for a graduate of a reputable dental college. The fee for registering a diploma is \$25.00.

Address all communications to

F. O. HETRICK, *Sec'y*, Ottawa, Kans.

VIRGINIA BOARD OF EXAMINERS.

THE next meeting of the Virginia State Board of Dental Examiners will be held at the Medical College of Virginia, Richmond, Va., beginning at 9 A.M. Tuesday, June 11, 1907.

R. H. WALKER, *Sec'y*, Norfolk, Va.

ILLINOIS BOARD OF EX- AMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn sts., beginning Monday, June 3, 1907, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five

consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university, or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license.

Address all communications to

J. G. REID, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

OHIO BOARD OF EXAMINERS.

THE regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio will be held in Columbus, June 25, 26, and 27, 1907. Only graduates are eligible to examination. Application, accompanied by fee (\$20.00), should be filed with the secretary by June 15th. For further information address

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, Ohio.

INDIANA BOARD OF EXAMINERS.

THE next regular meeting of the Indiana State Board of Dental Examiners will be held in the Capitol at Indianapolis, June 11, 12, and 13, 1907. Applications must be in the hands of the secretary at least five days before the above date. Address

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

NORTH CAROLINA BOARD OF EXAMINERS.

THE next meeting of the North Carolina Board of Dental Examiners will be held at Morehead City, N. C., June 24, 25, and 26, 1907. Applicants must register on or before 9 A.M. June 24th.

For further information address

R. H. JONES, *Sec'y*, Winston-Salem, N. C.

WISCONSIN BOARD OF EXAMINERS.

THE next meeting of the Wisconsin Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held Monday, June 10, 1907, at the Wisconsin College of Physicians and Surgeons, Milwaukee, Wis.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or has been an apprentice to a reputable dentist for five years.

For further particulars apply to

J. J. WRIGHT, *Sec'y*,
1218 Wells bldg., Milwaukee, Wis.

FLORIDA BOARD OF EXAMINERS.

THE Florida State Board of Dental Examiners will meet June 3, 1907, at 10 o'clock, in Jacksonville, Fla., for the purpose of examining applicants for license to practice in this state.

Applicants must furnish instruments in practical work, and in addition to the written examination will be required to put in one gold filling, one alloy filling, and to solder and finish one four-tooth bridge under supervision of the board. Bring bridge ready for investing. Only graduates of reputable dental schools are admitted to examination.

W. G. MASON, *Sec'y*,
Tampa, Fla.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE next examination of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning at three o'clock June 6, 1907, and continuing three days. All candidates are required to bring operating instruments, including dental engine, and such other appliances and materials as are necessary to do crown and bridge work. All applications, together with the fee, ten dollars, must positively be in the hands of the secretary by June 3d, and no application will be considered thereafter.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

TEXAS BOARD OF EXAMINERS.

THE Texas State Board of Dental Examiners will hold their next regular meeting at San Antonio, Texas, June 10, 1907, at 10 A.M. For further information address

C. C. WEAVER, *Sec'y*,
Hillsboro, Texas.

CALIFORNIA BOARD OF EXAMINERS.

THE next examination of the California Board of Dental Examiners will be held in Los Angeles beginning June 10, and in San Francisco beginning June 17, 1907.

C. A. HERRICK, *Sec'y*,
Jackson, Cal.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examination of applicants for registration will be held in Manchester, N. H., June 11 to 13, 1907.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

WEST VIRGINIA BOARD OF EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold their next meeting for the examination of candidates at Wheeling, W. Va., June 12, 13, and 14, 1907. For further information address

H. M. VAN VOORHIS, *Sec'y*,
Morgantown, W. Va.

KENTUCKY BOARD OF EXAMINERS.

THE Kentucky State Board of Dental Examiners will meet for the examination of applicants at Louisville, Ky., June 4, 1907, at The Masonic, commencing at 9 A.M.

Each applicant for examination shall be required to deposit with the secretary of the board his or her recent photograph, with signature on the reverse side, both of which shall be certified to by the dean of his or her graduating college, or other parties accept-

able to the board. Applicants must be graduates of reputable dental colleges.

Every applicant shall be required to treat two or more teeth affected with pyorrhea; to insert two gold fillings; two amalgam fillings; impression, bite, and articulating teeth of upper and lower denture; one bridge on model, consisting of one shell and one Richmond crown and two porcelain-face dummies; one gold or porcelain inlay or Logan crown, one practical case diagnosis; all to be done before the board. A general average of 75 per cent. is required. Applicants will be graded upon a basis of 60 per cent. on practical work and 40 per cent. on theory.

Applicants must come prepared with instruments, engine and material, excepting bellows, blowpipe, lathe, stones, and polishing cones, to do the above-mentioned work.

The board would advise the use of gold in the above bridge, as it would cost very little more than German silver after disposing of it.

Application for examination must be made upon blanks furnished by the board, and must be accompanied by a fee of \$20.00.

J. RICHARD WALLACE, *President*,
The Masonic, Louisville, Ky.

IOWA BOARD OF EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, June 6, 7, 8, 10, and 11, 1907. Applicant must hold a diploma from a college on the accredited list of the National Association of Dental Examiners, and must state where he attended first, second, and third year of college. Address

E. D. BROWER, *Sec'y*, Le Mars, Iowa.

MINNESOTA BOARD OF EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold a special meeting at the dental building of the state university, in Minneapolis, June 6, 7, and 8, 1907. All applications must be in the hands of the secretary by 10 o'clock June 6th, as examinations will begin at 10.30 o'clock sharp. All blanks, paper, and patients supplied by the board. Operating instruments, etc., must be brought by the applicant. Any further information will be given by addressing

GEO. S. TODD, *Sec'y*, Lake City, Minn.

SOUTH CAROLINA BOARD OF EXAMINERS.

THE South Carolina Board of Dental Examiners will meet in annual session at Anderson, S. C., on June 28, 1907, to examine applicants for license. For further information address

BROOKS RUTLEDGE, *Sec'y*,
Florence, S. C.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 13, 14, and 15, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

Applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before June 6, 1907. By order of Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners of the District of Columbia will take place July 1, 2, and 3, 1907. All applications must be accompanied with a fee of ten dollars, and should be filed not later than June 22d with

WM. B. DALY, *Sec'y*,
1340 New York ave. N. W.,
Washington, D. C.

VERMONT BOARD OF EXAMINERS.

A MEETING of the Vermont State Board of Dental Examiners for the examination of candidates will be held at the State-house, Montpelier, Vt., Monday, Tuesday, and Wednesday, July 1, 2, and 3, 1907, commencing at 2 o'clock of July 1st. All applications, together with the fee, \$25.00, must be in the hands of the secretary not later than June 23d. Application blanks and further information may be obtained from

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vt.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1907.

March 5.

No. 845,835, to ELMER E. WEIGHTMAN. Gas regulator for dental vulcanizers.
No. 846,030, to WILLIAM G. HULLHORST. Instrument tray.
No. 846,304, to JAMES F. HARDY. Punch.
No. 846,420, to ALBERT W. MCKENNEY. Dental bracket.

March 12.

No. 846,900, to WILLIAM O. BLOOM. Tooth-brush.
No. 846,998, to JOHN F. HAMMOND. Pyrometer.

March 19.

No. 847,591, to H. S. MILLER. Dental hand-piece.
No. 847,778, to J. W. IVORY. Tooth-separator.

March 26.

No. 848,403 to P. R. SKINNER. Dental obtunder.
No. 848,334, to P. E. WILLIAMS. Combination dental plugger.

THE DENTAL COSMOS.

VOL. XLIX.

JUNE 1907.

No. 6.

ORIGINAL COMMUNICATIONS.

THE TEETH IN RELATION TO EAR AND THROAT DISEASES.

By C. P. GRAYSON, M.D., Philadelphia, Pa.

(Read before the Southern Dental Society of New Jersey, April 17, 1907.)

AT the very beginning of my paper I regret that my conscience compels me to make a rather mortifying confession, which is that I have much reason for believing that the members of my profession, and even of my own specialty, are not nearly so generally alive to the intimate relationship existing between the diseases of the nose, throat, and ear, and those of the teeth, as are the members of yours. It is, for instance, not at all an infrequent occurrence in my work to have patients sent to me by some of the Philadelphia dentists who realize that in order to obtain a successful result from some prosthetic or other measure that they contemplate, an essential preliminary will be the removal of a mass of adenoids from the patient's naso-pharynx, or perhaps of a pair of enlarged faucial tonsils or a marked deflection of the septum that may

be seriously interfering with nasal respiration, and consequently with the normal development of the dental arch.

And in the same way it has been brought to my notice that many of you dental surgeons are quick to recognize that certain of the nutritional disturbances affecting the teeth are dependent upon chronic digestive impairment that is attributable to some catarrhal affection of the nose and throat. And yet how often do I meet with cases of chronic lacunar tonsillitis, or of persistent pharyngeal and laryngeal catarrhal inflammations, that have resisted treatment for months simply because the throat specialist has entirely overlooked or has failed to sufficiently appreciate the etiological influence of a depraved dental condition, and has neglected to call upon you for advice and assistance! It is scarcely to be supposed

that any rhino-laryngologist fails to recognize that the nose represents, both anatomically and physiologically, the threshold of the respiratory tract, but is there any less reason for his clear perception of the fact that it is the teeth that bear precisely the same relation to the digestive tract? Probably no one would dispute the assertion that it is impossible to have a perfectly healthy throat and lower air-passages in association with an unhealthy nose; and yet, I repeat, there seem to be a surprisingly large number of physicians who see no incompatibility between diseased teeth and a normal digestive tract below them.

Of course it is my privilege to speak only of those portions of the digestive tract with which my special work makes me the most familiar—the mouth, the fauces, and the pharynx; but in my writings and lectures for almost the past score of years I have never neglected the opportunity to emphasize the importance of gastro-intestinal sanitation as an aid to the successful treatment of nose, throat, and ear diseases. There is never a class that graduates from the Medical Department of the University of Pennsylvania without having been repeatedly told that the very first thing to examine when a patient presents himself for the relief of some nasal or throat trouble is the condition of the teeth.

PHYSIOLOGICAL ANALOGY BETWEEN THE NOSE AND THE TEETH.

The physiological analogy between the nose and the teeth is a most striking one. It is the nose alone that by filtering, warming, and moistening the air, prepares it for its subsequent reception by the bronchial tubes and the pulmonary cells; and it is just as exclusively to the teeth that the processes of digestion and assimilation look for the thorough and essential preparation of the food materials that they are subsequently to work upon. It will surely be perfectly apparent that the analogy between these two structures extends likewise into the domain of pathology, for if they are dis-

eased to any material extent the ultimate implication of the lower portions of the tracts of which they represent the beginnings will be inevitable. If they are diseased the respiratory and nutritive streams are both poisoned at their respective sources, and all the remote and later effects of this poisoning will prove irremediable until these primary foci of disease are restored to health.

So much for considerations of a general nature, and now, with a closeness of their relation thoroughly appreciated, it will not be difficult to compile a list of those diseases of the nose, throat, and ear that are etiologically dependent upon dental disease.

PATHOGENIC CONNECTION BETWEEN THE TEETH AND THE MIDDLE EAR.

To begin with the ear, the frequency of acute median otitis in association with the dentition of childhood is a well-known occurrence, and the conveyance of the irritation from the gums to the middle ear is easily explained by the intercommunication of the nerve supply of the two structures. May I recall to your memories the communication of the greater superficial petrosal nerve with the tympanic plexus, and by means of the Vidian nerve with Meckel's ganglion, which is associated with the superior maxillary nerve, from which the supply of the upper teeth is derived. The small superficial petrosal nerve is also in connection with the tympanic plexus and joins the otic ganglion, and in this way communicates with the inferior maxillary nerve and its inferior dental branch to the lower teeth. The pathogenic connection between the teeth and the middle ear is by no means demonstrated only in children; in adults I have failed a number of times to make much impression upon chronic purulent inflammations of the tympanum until I had secured through the co-operation of the dentist the removal of a persistent reflex irritation of dental origin.

In passing from the ear to the throat, I would like to stop for a moment or two

at the nose, and exchange ideas with you concerning the inflammations of the largest and most frequently affected of its accessory cavities—the maxillary sinus. Here we are on common ground, for the diagnosis and treatment of disease in this cavity are as much a part of your work as of that of the rhinologist. To be perfectly frank, I must confess that with reference to the comparative frequency of etiologic activity on the part of the teeth and of intranasal disease in the production of the antral inflammations, I have been during the past twelve or fifteen years more or less of a shuttlecock. My first opinion was that the teeth were the more often responsible for the antral involvement, but during several added years of experience I accumulated sufficient reason, I thought, for changing my views, and gradually came to believe that it was to infection or to simple extension of inflammation from the nasal fossæ that the larger number of antral inflammations were due; and then, once more, after an unusually long and almost unbroken series of cases that were of unmistakably dental origin, I drifted back to my first opinion. Now, however, with a little further shifting of my ground, I think that I am finally anchored, and I should say that if we exclude the many cases of maxillary sinusitis that are secondary to the infective rhinitis of influenza and grippe, the majority of all the others are traceable to the teeth. Possibly you may tell me a few things tonight that may compel me to modify even this opinion, but I think it is a pretty conservative one

now, and that it will not need much alteration.

THROAT DISEASES AND NEGLECT OF THE TEETH.

And now, to descend to the faucial region and the throat, I am perfectly confident that many obstinate cases of chronic lacunar tonsillitis have arisen from and have continued because of neglect of the teeth, and I am equally sure that in the production of a large number of acute infective inflammations of the tonsils, pyorrhea alveolaris and dental caries have played an active part. Am I wrong in thinking that there could scarcely be a more fertile and nutritious soil for the breeding of pathogenic organisms than that found in the cavity of a carious tooth? And when such cavities become over-populated, it is but a short journey to the crypts of the tonsils, which soon become the sites of new and thriving bacterial colonies.

Finally, I think that I am justified in believing that even chronic *laryngeal* catarrhs may be maintained, if not originated, by such diseases of the teeth and gums as I have mentioned. There is no occasion and there would be no excuse for my wearying you with the details of a number of cases in evidence of this, but I need only to say in support of my belief that in spite of the re-establishment of the health of the nose and nasopharynx, these laryngeal catarrhs will all prove refractory until the teeth and the alveolar tissues are put in equally good condition.

LOCAL ANESTHESIA IN DENTAL OPERATIONS.

By VAL MACDONALD, L.R.C.S.Ed., D.D.S., Univ. Pa., Melbourne, Australia.

IN this nerve-racking age of ours all seem to be living the strenuous life, with the safety-valve screwed down, and the determination to reach the goal of success or burst in the attempt. The

result is, in greater or lesser degree according to the length and intensity of the struggle, a case of nerves! nerves! nerves!

No one is perhaps more faced with the

difficulties in dealing with the overwrought, highly strung nervous individual than the modern dentist. From earliest times there has existed an almost instinctive dread of the dental chair and its associations. In those early times, with clumsy instruments, with lack of knowledge of asepsis, and without anesthetics, the operator being also without any scientific knowledge of his craft, small wonder that such a dread existed!

But time has rolled on, and with it the modern dentist has been evolved, with a more or less exact knowledge of his work begotten of scientific training and the assistance of beautiful instruments, anesthetics general and local, and asepsis. The forceps has replaced the barbarous locking key, and the dental engine has reached perfection, and is no longer the "infernal machine" of our forefathers. With all ordinary dental operations it is no longer necessary to associate extreme pain; and the old-time dread is gradually becoming dust-covered in the recesses of ancient memories.

PAIN IN CAVITY PREPARATION.

In cavity preparations, for example, it is seldom that extreme pain need be caused if the operator have the necessary knowledge of the anatomy of the tooth. One of the greatest causes of pain is, I feel sure, the use of blunt burs, also too prolonged use in one spot, causing overheating with its resultant pain. In many cases it is sufficient to use a warm solution of sodium bicarbonate to allay any hypersensitiveness of dentin, especially where the cavity has been left for a few days with a cotton dressing in it. If this plan fails, or in addition to it, the usual methods, *i.e.* applying carbolic or Robinson's remedy, etc., after thoroughly drying the cavity, may be employed, and are usually found to be efficacious. These and sharp burs are the simple remedies sufficient for ordinary cases in the average patient. But the nervous patient comes along, afraid of anything and everything, and pain, however slight, is "acute." Also, in the average

patient, a really hypersensitive cavity is met with. How must we deal with such cases?

Remedies are at hand; so also is the danger of their abuse—as ably pointed out in the editorial in the December issue of the *Cosmos*, wherein it is said that "The resort to anesthetics, or other artificial means for escaping the primal curse, is too often a device which 'makes cowards of us all,' by destroying the powers of both moral and physical resistance to the ordinary stress of life. There is a danger in this tendency to continually 'sugar-coat' disagreeable human sensations, because it will in time destroy the power of human endurance."

ON THE USE OF COCAIN INJECTION.

Also, the same editorial, in criticizing the method of obtunding sensitive dentin advocated by Professor Touchard and others, that of cocaine injection, takes exception as to the risk of introducing "a poisonous drug into the circulation, with its attendant risks of septic infection;" and continues, "and while from a scientific point of view the method described by Touchard is interesting, and while it may have a useful place in isolated and extreme cases, we consider its promulgation as a method to be generally employed as one fraught with large possibilities of danger. We regard it as wrong on moral grounds, because it panders to that weakness of nervous resistance which is the basis of inebriety, hysteria, low moral tone, and loss of vigor, which in its protean manifestations is so insidiously undermining the social fabric."

The dangers so pointed out of the indiscriminate use of this method of anesthesia are very real, and cannot be too frequently brought before the dental profession or public. With many distinctly nervous and hysterical cases it requires but one or two visits, with firm sympathy and care, to reduce such patients to a normal level, so to speak. It will generally be found that such individuals have suffered severely—and all too unnecessarily—at other hands, and

have good reason for the fear which it is the first duty of the operator to dissipate.

When "pain within reasonable limits" is looked upon as a "moral tonic," it at once calls for a definition of "a reasonable limit."

"PAIN WITHIN REASONABLE LIMITS."

When chloroform and ether were first introduced, strong objection was raised in many quarters against any attempt "to annul a pain that God had intended should be borne." More especially was this heard in connection with midwifery and the use of chloroform. Many women can go through even the ordeal of childbearing without a thought of any anesthetic. Modern dress has no doubt done much to render that ordeal more difficult in many cases, but even to the savage such anesthesia would often come as a blessing, and few would now be found to refuse its aid.

The "reasonable limit" must depend upon two factors—(1) The individual. (2) The operator.

Many people have a dread of a general anesthetic, and it seems unnecessary to subject such persons to one if some safe local anesthetic will answer—provided anything at all is necessary. Take a case in which the extraction of one or more teeth is called for. Are we to use a local or a general anesthetic? We must first consider which class is the safer, and again make further choice from whichever class, local or general, is chosen. So, again, occasion may arise in which we must consider whether a cavity, which is extremely sensitive, should be prepared with or without other than the ordinary means of obtunding sensitive dentin. Is the pain or the anesthetic employed likely to do most injury to the individual?

I have known of dentists who, to obtain a slight peripheral anesthesia, allowed the patient to inhale from time to time a small quantity of ether or chloroform—a practice sufficiently dangerous to condemn absolutely in the mere mention.

In 1905, when in Edinburgh, I was impressed by the major operations so frequently performed with the aid of cocaine and adrenalin chlorid, or with eucain and adrenalin chlorid, though the first combination was much preferred. I was also struck with the growing use of cocaine solutions for purposes of extraction. Seeing the use of cocaine so successful in general surgery, I could not see why it should not be safely used by the dentist, and determined myself to try it, first for cases of extraction. In these cases I worked with a 1 per cent. solution of cocaine hydrochlorid, and the results so pleased me that one day, in cutting an extremely sensitive cavity in which I had tried all the usual remedies without good result, I injected 15 minims of the 1 per cent. solution around the tooth. The result was a slightly lessened sensitivity of the dentin, but not greatly so. I left a dressing in the tooth, and next day used the combination of cocaine and adrenalin chlorid, and the effect was complete anesthesia of the hypersensitive dentin.

Since that time I have used the combination for all extractions in which I have used local anesthesia, also in the few cases in which I have found it necessary for purposes of excavation. Although I have used it in some 150 cases of extraction I have never had the slightest sign of sloughing or ill effect. My method has been as follows:

METHOD OF USING COCAINE-ADRENALIN SOLUTION.

Preparation of solution. To a 1 per cent. solution of cocaine hydrochlorid I add an equal quantity of a 1:10,000 solution of adrenalin chlorid in normal saline solution. This gives me therefore a solution containing $\frac{1}{2}$ per cent. solution of cocaine with 1:20,000 of adrenalin. This strength is sufficient to give perfect anesthesia when from 10 to 15 minims are injected around the tooth, either for extraction or excavation; and working with a solution of known strength is essential in order to keep within safe limits. The gum is now well swabbed

with an antiseptic solution over the area to be injected on both sides of the tooth. The injection is now made slowly, the blanching of the gum giving a rough idea of the extent injected. I do not find it necessary to make a very deep injection, and never inject with the point of the needle on the periosteum, as I believe that may be one source of trouble met with; for I can conceive that if injected into the resisting periosteal or bone tissue, the congestion which always follows the use of cocain might cause thrombosis (through strangulation) in the small vessels of that area just as does arsenic when applied to the dental pulp. With this precaution and the use of a thoroughly sterilized syringe and fresh solution, there can be but little danger of cellulitis, sloughing, or necrosis. Although Drs. Cryer and Perry have reported cases of necrosis and ascending degeneration of nerve trunks after the use of cocain injections, by other operators, they could not give the requisite information as to conditions under which the injections were made as regards health and condition of patient, preparation of mouth, sterilization of syringe and fresh solution or strength of the solution used. I am of opinion that in those cases due regard to these points by the operators did not obtain.

The use of the adrenalin enables a considerably less and weaker quantity of cocain to be used; for by its constricting action on the vessels of the part it delays the too rapid absorption of the cocain and so gives it a longer time in contact with the parts it is sought to anesthetize.

The resulting anesthesia is no doubt in part due to the direct action of the drugs and in part a pressure anesthesia. The increased pressure caused by the volume of the solution restricted by the tissues assists in forcing the drugs into the tissue adjacent and so helps the anesthetic action.

Already some men use cocain and adrenalin in the preparation of all cavities simply for the sake of a "painless" reputation and without a due regard to the merits of the case. Such abuse is to be utterly condemned as unworthy of

the profession. It is the abuse and not the judicious use of any mode of procedure that is open to criticism.

Even if the patient object to a general anesthetic for an extraction, it is for the operator to judge whether he should or should not operate under one. The feelings of the patient must on no account be allowed to override the better judgment of the operator.

If the operator incline to cocain rather than to a general anesthetic, he must first be sure that the risk is less in "introducing a poisonous drug into the circulation" by this method, than by inhalation as with a general anesthetic. Cocain may be considered contra-indicated in cases of known peculiar susceptibility to its toxic effects, in pregnancy, in hysterical subjects—in all those, indeed, to whom slight shock is likely to bring untoward effects. In such cases nitrous oxid is considerably safer, especially in the hands of the novice. The likelihood of the cocain habit being induced is, I believe, remote where so small a quantity and so weak a solution as I have described is used.

The flush and rapid pulse caused by the adrenalin after the first few minims are injected rapidly pass away and need not cause alarm.

PRECAUTIONS.

If used for excavating sensitive dentin, I would emphasize the fact that it is seldom necessary. Where it will be found useful is in painful cervical cavities. In cavities which are in close proximity to the pulp, or where the pulp has been much irritated, the use of cocain and adrenalin is, I believe, distinctly contra-indicated, for the after-congestion may cause further pain and even death of the pulp. In any case where used for excavating I think it advisable on completion of the filling to use a counter-irritant on the gum to lessen the risk of after-congestion of the pulp. I also desire to emphasize the fact that only a $\frac{1}{2}$ per cent. solution of cocain is necessary, and that whatever strength is employed not more than $\frac{1}{4}$ grain of co-

cain should be injected. Thorough asepsis is a most necessary adjunct to success in this as in any other operation, and I fear that the syringe including the needle, is too frequently a sad offender in this respect. The solutions used should be freshly prepared, and the habit of filling the syringe from the bottle cannot be too strongly condemned. Rather pour out the quantity required into a sterilized porcelain dish, or watch-glass, and fill the syringe from that.

In conclusion I would say that while I agree in great part with the sentiments expressed in the December editorial referred to, I do not altogether do so.

There is surely a moral courage requisite to bow to defeat and to cry "Enough!" as well as to continue a hope-

less struggle at the certain cost of wrecking the organism. So, in considering the degree of pain to be inflicted and endured, we must weigh it in the scale with the chosen anesthetic, and judge as to whether the pain or the anesthetic will do the least harm; and in the majority of cases where it is necessary to so consider, I believe the verdict will be for the anesthetic. The Spartan youth who hid the stolen wolf beneath his toga and suffered the agony of disembowelment rather than utter the cry that would proclaim him a thief showed a rare courage. But that same Spartan youth, of such proved grit, by casting out the wolf, acknowledging his lapse, and devoting the vital energy thus saved to better things had surely done his country an infinitely greater service!

ORAL HYGIENE IN PUBLIC SCHOOLS AND INSTITUTIONS: WHAT ARE WE GOING TO DO ABOUT IT?

By **RICHARD GRADY, M.D., D.D.S.,** *Annapolis, Md.*

(Read at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, June 9, 1906.)

A DENTAL practitioner's insistence upon the value of the teeth and the importance of their preservation is quite often regarded by the laity as a professional exaggeration which need not be taken too seriously. What is said in dental journals is to a great extent ineffective, because of their failure to reach the people. Hence the progress of public sentiment respecting the teeth has been necessarily slow.

It is seldom that we have an opportunity to declare ourselves in public, or that anything said by us on the subject of dentistry, or the teeth, commands general attention; yet when Professor Osler, in an address in England last fall, urged that the mouth and its contained organs be kept in a clean and hygienic condition, together with routine inspec-

tion of the teeth of school children, and educating the public along dental lines so that better nutrition and consequently better health may be secured, these sentiments which have been uttered by us for years were published in many medical journals and newspapers, accompanied at times with favorable editorial comment.

SOME PREVIOUS WORK ON THIS SUBJECT.

The subject chosen for me by the committee of arrangements is not a new theme in my hands, but is one on which my pen and voice have often been busy. In a reprint of my graduation thesis in 1879, I appended some rules for preserving the teeth, with the comment that there is scarcely a subject of personal

character so sadly neglected, or so little understood by the public, as the care of the teeth. Later being made chairman of the Maryland State Dental Association committee on oral hygiene in public schools, I made a study of the question under three heads—What do we want? Why do we want it? What is the best way of getting it?—in a paper read before the American Medical Association entitled "Co-operation of the Public Schools in Teaching Good Teeth, Good Health." Still later (in 1900) I offered a resolution in the National Dental Association, asking for the appointment of a special committee to consider the expediency of inaugurating steps looking to the co-operation of the public schools in teaching oral hygiene, and upon the appointment of such a committee, was made its chairman—an office which I endeavored to fill with conscientious fidelity up to the time it was entrusted to another last year, having been in communication with dentists at home and abroad who have made uniform examinations of the teeth of children from six to fifteen years of age. The results of this systematic propaganda are recorded in the Transactions of the National Dental Association from 1900 to 1903 inclusive; in the Transactions of the International Dental Congress (1904), under the title "Benefits of Mastication and Insalivation," and elsewhere in circulars and dental journals. I have endeavored to keep the subject alive and get it a hearing whenever in my power. It is encouraging to know that good ideas have extraordinary vitality.

Can I find anything new to say on this question, which is assuming greater importance in the minds of conscientious and progressive practitioners, whose sole and unselfish purpose is to promote hygienic conditions in the mouth, and who recognize that there is a responsibility resting on the profession which should command serious consideration? Can I place old thoughts in such a new light that they may, perchance, strike a responsive chord, and by so doing stimulate other thoughts to our advantage? I speak from the varied experience of

twenty-seven years as a visiting dentist to schools and institutions, and an opportunity such as few, if any, dentists have had of noting the teeth of young people from six to twenty-four years of age.

AS OTHERS SEE US.

We stand in the limelight of the twentieth century, and have earned for ourselves an honorable place; but judged by a distinguished educator quoted by Dr. Potter of Boston, "The dental profession seems most interested in repairing broken-down structures, and too little in preventing such conditions"; or in the words of Governor Hastings of Pennsylvania, "Dentists live inside a tooth until they become cranks."

In these pictures we "see ourselves as others see us," and the words are somewhat confirmed by Dr. Crawford of Nashville, who says, "We get together and brag about being the greatest profession in the world. Let us get up and stop bragging, and do something! Dental caries is ravaging this country; this is attributable very largely to our lethargy. Let us get up and do something; then the people will stop calling us 'tooth-carpenters,' and will pay some attention to what we say. We should act as a solid phalanx, and when a man sees a right thing he should indorse it, whether it comes from the east, west, north, or south. Let us stand up for what is right."

Dentistry as an organized profession is younger than either law or medicine. The public is consequently not so familiar with it and the benefits it confers, but gains its knowledge largely from grossly misleading advertisements of the dental parlors. Many dentists do not take the trouble to teach their patients how essential sound teeth are to their well-being—the relation of clean teeth to good health—that cleanliness does away largely with the tendency to decay. A campaign of education should be carried on in every dental office, and by every dental organization. The responsibility of every dentist is great; the responsibility of every dental and medical school,

and of every dental association and dental examining board, is greater. We are all responsible to the future. "That one should be ignorant who has capacity for knowledge—this I call tragedy," says Carlyle.

Civil service reform is so wide in its scope that we find it has special interest for every class of the people. The fact that it requires a physical, as well as a mental and moral examination of candidates for office, commends it to all who are especially interested in the physical improvement of the race. The hygienic value of the dental feature came out unexpectedly at a meeting of the National Civil Service Reform League, which I attended recently in this city. One of the speakers told of a mechanic in the "East side" of New York, who, having achieved popularity in his neighborhood, aspired to become a "ward leader." A proper preliminary step, he decided, was to be enrolled on the police force. He attended night school to fit himself for the necessary examination, which he passed with credit; but he was rejected by the physical examiners on the ground that he was the victim of dyspepsia. His teeth had been neglected in his youth, mastication was imperfect, and dyspepsia was the result. The examiners held very wisely that dyspepsia tends to irritability; and that a man suffering with this disease would lack the judicial calm which is so characteristic of the New York policemen. The man was an altruist in spite of his dyspepsia. He went to his friends and supporters and told his experience, and the result was a boom in tooth-brushes throughout the entire ward.

A MATTER OF TIME.

If we expect immediate results from education, we shall be disappointed. It is safe to estimate that it takes a period of from thirty to fifty years—let us say the time of one generation—to secure the popular approval of matters of minor importance; while to establish greater principles, a longer period is usually involved. If we take a more extended

view of the subject, and point the public in the right direction, the condition is not hopeless. It is "up to us," in the language of the day, to follow the high ideas of Dr. S. G. Perry of New York, who says, "The social as well as the professional status of the dentist of today is determined by the dentist himself. If he be an educated gentleman, all high places will be open to him." As to the future he says, "I venture to predict that we shall acquire a keener sense of our responsibilities, be more alert in the prevention of diseases of the teeth, and more careful to instruct our patients in their proper care. We shall be more alive to the importance of prophylaxis. It will eventually assume first place in our practice."

DR. EVANS' RECEPTION BY NAPOLEON III.

Dr. Evans in his "Memoirs" just published, says of Napoleon III, "He found the dental art to be of great use to him, and accordingly had an excellent opinion of dentists in general, and saw no reason why they should not be as proud of their specialty as the practitioners of any branch of medicine or surgery"; and adds "I was richly repaid in many ways, but more especially by the direct support and encouragement he gave me in the practice of my art and the social consideration he accorded to me, and through me to my profession. At a ball to which Mrs. Evans and myself had been invited, we overheard a conversation. 'Who is that woman?' said one lady to another; 'she is so delicate and lady-like—she looks like an American!' 'Yes, she is,' was the reply; 'and only think, she is the wife of a dentist! How dreadful!' A few minutes later the emperor approached us and shook hands with us both.

"As an American citizen I had never thought it would be necessary for me to feel ashamed of myself socially, or that I was to be deprived of the privileges and civilities usually conceded to practitioners of the liberal arts and professions. The emperor quickly saw how I felt about the position I was to hold in his

immediate *entourage*; and, since he was not disposed to recognize distinctions of any kind among men, except such as were determined by intelligence, personal accomplishments, or special abilities, I was very soon admitted to the Elysée officially on a footing of equality with doctors of medicine, surgeons, university professors, and men of science in general. When the court was established, I received my appointment of 'surgeon dentist,' and in the same form and on the same terms as the other doctors and surgeons. My court dress was the gold-embroidered special uniform worn by every member of the medical staff. We all received the same compensation. Once having a standing at the imperial court, the way was opened for my reception at other courts. I am sure that the consideration which had been shown to me by nearly all the royal families of Europe has been of very great service to me personally; and I am equally sure, but still more pleased to believe, that my profession has been benefited and honored also."

DR. OLIVER ON THE STATUS OF THE
"CONTRACT DENTAL SURGEON."

All of which—especially the "footing of equality with doctors of medicine," "same compensation," and "gold-embroidered special uniform worn by every member of the medical staff"—is in striking contrast to the picture presented by Dr. Oliver, U. S. Army Dental Surgeon at West Point, in his paper at the last meeting of the National Dental Association. He said "The present status of the contract dental surgeon is continually a source of humiliation and degradation to all, and to those more sensitive men, who have occupied social positions at their homes equal to the best in their several communities, it is of course more keenly felt. In the matter of uniform we are especially unfortunate. . . . It is absolutely impossible to tell a dental surgeon from an enlisted man of the Hospital Corps at a distance of ten feet. . . . It seems a great injustice to educated professional men, who have spent

years in acquiring a technical and scientific knowledge of their specialty, and who have qualified before a competent examining board before entering the service, to be so meanly uniformed. . . . What is urgently required is . . . that there may be some future held out to the successful and efficient dental surgeon . . . where he may enjoy the social distinction of a post without reserve and without feelings of humility, and can appear like the rest of the officers at the various functions, formal and informal, and who at various military ceremonies can feel and act as an officer and a gentleman."

With the development of the mechanical aspect of dentistry, which has resulted in such a degree of perfection in methods, appliances, and technique of dental practice as to leave little room for further improvement of a radical character, has come, as a result of experience, a fuller knowledge of its limitations as a remedial agency. It may be pleasing to some to learn of the admiration of the English writer who tells in the *Fortnightly Review* that "hundreds of thousands of dentists are forever filling and scraping and pulling American teeth," and who says, "The American dentist is the greatest in the world. Not only does he produce an exact copy of nature, but his is the only instance known to science where human ingenuity excels nature's—his teeth do not ache"; or the words of Oliver Wendell Holmes, "The dental profession has taken from old age its most unwelcome feature, and lengthened enjoyable human life far beyond the limit of years when the toothless and purblind patriarch might well exclaim, 'I have no pleasure in them!'"

I believe we have come to a point in our history where we should take another step, and a very important one, where in the words of Edward Everett Hale, "We must serve the world, not like the handcraftsman, for a stipend accurately representing the work done, but as those who deal with infinite values and confer benefits as freely and nobly as does nature."

ORAL HYGIENE.

Not repeating what I have previously written, except for reference, I want to plead in this twenty-minute paper—and not tax your patience longer—for oral hygiene—which includes dental examination and attention—in public schools and institutions for the children of the state, such as schools for orphans and the blind, hospitals, reformatories, and fresh-air societies; and to ask the members of this union meeting to say what they are going to do about it, especially in providing leaflets to be used in school physiologies.

Personally, I have been earnestly striving for years to make instruction in oral hygiene an essential part of public school education, which would be an agency to bring such knowledge into the home life of the people, thus identifying it with the health of the household. I have made routine examinations of the teeth and recorded them on charts—which correct errors in those previously published—thus confirming statements that a systematic examination of the teeth of children at home and abroad reveals the fact that from ninety-two to ninety-five per cent. have defective teeth, so that there is no longer need of further statistics of this kind; have called attention to the mischievous teaching respecting the teeth in school physiologies; have issued pamphlets to school officers as a means of spreading information respecting the need of teaching oral hygiene in public schools, believing that school officers and other friends of education will be most willing to receive it. The parent, the teacher, and the newspaper editor, it is hoped, will be enlisted in the cause. The scheme is essentially an educative one, and thousands of dentists, scattered throughout the country, who command confidence and respect, can be counted on to assist in the work, which would be entirely altruistic and free from what might be called professional selfishness. Now what have you done, personally?

In this city (Washington) Dr. H. C. Thompson informs me, relative to school

hygiene: "We undertook that work on plans of extensive scale, when, by reason of the superintendent, it was stopped. He wanted us to do all the work and give the results to him, thereby giving him credit for it all, and allowing the profession to remain in the background. Of course everything stopped right there, and still stands *status quo*."

In Baltimore, a committee of which I was chairman—with Dr. B. Holly Smith, the president of the National Dental Association, who appointed the committee on oral hygiene in public schools, Dr. G. Marshall Smith, who seconded the resolution in the National Dental Association calling for the appointment of the committee, and Dr. Wm. A. Mills, on whose motion the Maryland State Dental Association appointed a standing committee on oral hygiene—appeared before members of the school board by invitation fully four years ago, and requested permission to examine the mouths and teeth of pupils from six to fifteen years of age in four white schools and one colored school in different sections of that city, and to give brief talks to the students of the city college and high schools on the care of the teeth.

We argued that few persons realize what an important part the teeth play in the preservation of health, presenting statistics, and saying that we would inculcate in children the virtue of mouth-cleanliness, and teach them hygienic habits which would stand them in good stead their life long; that no difficulty ought to be encountered on the part of school officers in introducing lessons on the care of the mouth and teeth. After the meeting I was told by a member of the board that our arguments made no impression. As Dr. Hayden said about his idea of a national convention of dentists in 1817: "The pear was not ripe."

OUR MOTIVES SOMETIMES DISTRUSTED.

Why we failed at that time has been partly explained: (1) In the statement that one of our professional brothers—who couldn't conceive how a man who is really competent would devote

much time to work that did not directly promise a money return—had represented to a rabbi, a member of the school board, that our motive was mercenary and that we wanted the pupils for patients. (2) In the conversion of the *ex-officio* member of our committee to these unfair and prejudiced sentiments of another member of the school board: "The method would make the public schools unpopular; the movement would not be tolerated by the Johns Hopkins University and Woman's College; hence why should the poor man, because of his necessity, be subjected to anything he would resist were it in his power? By what authority does the school board order such an examination other than that it would affect the health of the neighborhood pupils by infection?" (3) The indifference of members of the association, fifty of whom were invited to appear before the school board and only five of whom responded. In this connection I want to record my recognition of the broad-minded president of the Johns Hopkins University, Dr. Ira Remsen, then a member of the school board, who said to me, "I am in favor of it on your statement without any argument."

Our experience is not singular, but is very much like that of the committee in San Francisco of which Dr. Frank I. Platt tells. He is particularly interested in the examination and care of the teeth of the children in school, though he does not know what course can be taken to bring about that much desired condition of affairs. He said that he was appointed on a committee to interview the board of education in San Francisco to see what could be done there, and he does not believe that he was ever treated more shabbily in his life, although he started out with honest intentions. On reviewing the work done in Europe and in some of our eastern cities and states, the committee did not seem to be at all impressed with the importance of the matter. When Dr. Platt referred to the fact that several years before the board had appointed an oculist to examine the eyes of the children in schools, it was insinuated that pecuniary profit had a

part in the motives of the profession concerned. These bodies must be impressed with the importance of this work. Back of it all there must be a change in education; dentists must be better educated. With men and women who realize the importance of this specialty, and who are enthusiastic, there will be an impulse that will not be put down. Dr. Platt stated that he has spent considerable time in working along this line, and is utterly disheartened to find how few men or women are really enthusiastic. Most of them are working for bread and butter. It is hard to arouse any enthusiasm, and I think the fault lies in the foundation—in the teaching. It is of vital importance to the coming generation of people in this and every civilized country that mouths be taken care of. If the authorities could be so impressed with the importance of this matter that they could not pass it over with a slur, then something might be accomplished. It might be a good plan for some of the profession to be elected mayors of cities.

DENTISTS MAY BECOME SCHOOL COMMISSIONERS.

If dentists can't become mayors, as advised by Dr. Platt, they may become school commissioners like Dr. Stiff in Richmond, where "absolutely no objection was raised and consent was at once granted." He writes, "I have found absolutely no opposition on the part of teacher, scholar, or parent."

CONCLUDING REMARKS.

I need hardly say to you, in conclusion, that our responsibility is the central thought of this paper; that the limited instruction given in our public schools on the care of the teeth is not sufficient; that the mere filling of a tooth—as typifying dental clinics—or the reading of papers to and at each other is not fully living up to our obligations.

We are called upon for more than this, and our code of ethics demands that we shall "educate the public mind so that

it will properly appreciate the beneficent efforts of our profession." It is time that those who would call themselves "professional" should truly realize the needs of their fellow men, for the health of the individual, for the comfort of the family, for the welfare of the state.

Dental education of the public, es-

pecially the children, given by and under the auspices of our district society and state association, will do more to stop quackery than legislation—a thing that ought to be done and should be done. "It is a holy thing," in the words of Lord Beaconsfield, "to see a nation saved by its youth."

FREE DENTAL SERVICE IN THE PUBLIC SCHOOLS.

By LOUIS OTTOFY, D.D.S., Manila, P. I.

HAVING seen frequent reference to the subject of the examination of the teeth of children in the public schools, and of rendering dental services to them, it occurred to me that it might be of some aid to those who are interested in this work to publish what is being done along these lines in Manila, especially in view of the fact that the Hon. Secretary of the Interior laid particular stress on the point that he be furnished facts and statistics regarding similar work in other cities. I am of the opinion that more of this work has been done in Germany than anywhere else.

If the work is inaugurated here—as I believe it will be in a short time—its influence upon the future must be almost incalculable, viewed from any standpoint, whether the economic value of better constitutions in the coming race, the uplifting and elevating influences of cleanliness in these islands, the creation of a dental profession for the future by creating a demand for dentists, or from any other viewpoint.

In order to induce the department of Public Instruction to consider the matter, upon the request of the secretary thereof, I presented the following argument and facts:

"64 ESCOLTA, MANILA, Dec. 3, 1906.

"HON. W. MORGAN SHUSTER, Secretary of Public Instruction, Manila, P. I.

"Dear Sir,—In conformity with my

promise of some days ago, I have the honor of presenting for your consideration the subject of introducing free dental service for the needy poor in the public schools of Manila, and, also in accordance with my promise, to present statistics and facts bearing upon the subject.

"GENERAL CONSIDERATIONS.

"It is a known fact that dental caries existed in the remotest time of which there is any human record. No one can give a reasonably correct opinion as to the condition of the teeth of a people or race, no examinations of the teeth of adults of any community ever having been made except in such institutions as hospitals for the insane, asylums for the blind, deaf, dumb, etc. It would therefore be impossible to say with any claim to accuracy whether the teeth of the Filipinos are better or worse than the teeth of any other race, or whether there is any difference in the general average condition between Tagalog, Visayan, Negrito, Moro, etc.

"THE CONDITION OF CHILDREN'S TEETH.

"Examinations and tabulation of the condition of children's teeth have been made during the last twenty years in nearly every civilized country, and the records thus obtained form a scientific

and reliable basis for deduction. It is needless to go into extensive and interesting details of this subject at this time; suffice it to say that the first investigations of this character were made simultaneously by Parreidt⁽¹⁾ in Germany, and Ottofy⁽²⁾ in the United States, in 1882. Since then a great many similar investigations have been made and recorded, notably by Albinger in Austria, Ricer in Denmark, Cunningham and Pedley in England, Röse, Voerckel, Weber, Berten, Worm, Jessen, and Fenchel in Germany, Ungvár in Hungary, and Hyatt, Merrill, Fogg, Habbeger, Nesbit, Allen, Rivers, and others, in the United States. It is only fair to say that our German cousins have done more along these lines than men of any other nation.

"It is probably not necessary to go into the interesting details of results obtained; suffice it to say that the extent of caries ranges from 20 to 25 per cent. Four years ago, by permission of Mr. Atkinson, the then superintendent of education, I examined the teeth of 500 Filipino school children in Manila, and found the percentage to be 23.5. The examination covered 13,711 teeth. Of the 250 boys examined, only 13 had entirely sound teeth, while of the 250 girls, 11 enjoyed a like blessing. My carefully prepared tables reveal practically the same conditions as were found elsewhere. It is therefore not necessary to enter into a discussion of them; suffice it to say that the conditions are bad, and that there is much room for improvement, more so than anywhere else, for in other countries the examiners have found a number of filled cavities, while here in Manila in a total of 3777 only 3 had been filled. It would be superfluous under these circumstances to enter into any argument or present facts to show the urgent necessity of dental care.

"BENEFITS TO BE DERIVED.

"To the intelligent observer it seems also unnecessary to give reasons why the ravages of dental caries should be checked. In a general way there can be

no question on the point that a good condition of the masticatory organs cannot be otherwise than beneficial to the entire system. Where the teeth have been cared for, other improvements have been noted, such as the reduction of loss of time from studies, freedom from pain and consequent excuse for absence from school, improvement of eyesight, etc. In the Philippines there is also, in a large measure, the educational influence upon the children themselves and its reflection on the parents, thus preparing these people for higher and nobler things along a line hitherto practically closed to them.

"RESULTS ELSEWHERE.

"In the United States the profession is just waking up to the importance of this work, and in a number of places free dental services are rendered to the public school children, notably in Cleveland, Ohio; New York, N. Y.; Milton, Pa.; New Haven, Conn.; Boston, Mass., and other cities. It must also be remembered that there are about sixty dental colleges in the United States distributed in the larger cities, and that all of these have free clinics attached to them, and that they make efforts to reach the school children. My information from abroad is not as complete as might be desired; while I know of the establishment of free clinics in the public schools of many of the cities of Europe, I am unable at this moment to give the authorities except in regard to Paris, France, and Witten, Elberfeld, Mühlhausen, Darmstadt, Gleiwitz, Strasburg, and Hamburg, Germany. I find, however, from the periodical literature of the profession, that there is a wide awakening in this field. The profession realizing that progress toward the prevention of the enormous loss of teeth can best be made by closer attention to the growing generation. As an illustration I can cite, from the examination of the teeth of the Filipino children, the first permanent molar—sometimes referred to as the "sixth-year" molar. This tooth normally is supposed to appear at the age of six. My observations in the United States lead me to

believe that it appears in that country more nearly at five and one-half years; while here in the Philippines I have seen it *in situ* at five years, and earlier. It should also be borne in mind that this is the first tooth of the permanent set to make its appearance, and is considered, even by well-informed people, to belong to the temporary set of teeth, and hence not deserving of preservation. Of this class of tooth, in the 500 children referred to I examined a total of 1942, of which number 1184 were carious or lost before the age of fifteen.

"METHODS OF RELIEF.

"The free clinics are maintained and supported in various ways. In some, the municipality has furnished the funds, established the clinic, and supports it with the funds of the government; in others, dentists as individuals or associations have established and maintain the clinic from their own funds, or in part from municipal funds or donations of generous people; in other cases they are supported and established by bequest, while in still others these various forms intertwine.

"PLAN PROPOSED FOR MANILA.

"At the outset I desire to state most emphatically that under no circumstances do I ask for nor will I accept any compensation whatever, in any manner or form, for any service I may render in this cause; and that I will give as freely of my time as it is possible for a private citizen, depending solely upon his own energies for support, to give.

"In 1904, while on a trip to the United States, I secured, for any purpose which may promise the greatest benefit, dental appliances and materials to the value of \$800, from liberally disposed manufacturers and dealers in the United States who knew of my past labors for the profession. This material I deposited in St. Paul's Hospital, and organized a dental clinic, supplementing it with necessary instruments, appliances, books, etc., from my own supply. For one and a half

years I have quietly conducted that clinic, never asking or receiving any compensation therefor. To be sure I merely supervise the work, and try to do so without loss of my own time during the hours demanded by my practice. This is not always avoidable; the time thus devoted to it is taken principally from that which otherwise would be devoted to some form of recreation. I quote from the report of November 30, 1906, with the explanation that while the clinic was nominally established on May 1, 1905, by reason of the unfinished condition of the hospital it was not in full operation until about October 1 of that year, or fourteen months ago; and further, with the statement that the income was derived from such work as required an outlay, and was used for the purchase of material and for compensation of the native in charge of the clinic:

"Summary.

"Total number of patients, May 1, 1905, to November 30, 1906, inclusive	1006
"Total number of operations.....	3047
"Total cash receipts	\$P.472.56
"Total value of operations at usual fees prevailing in Manila.....	\$P.6189.00

"The service at Bilibid prison (Friday afternoons), inaugurated last June, is continued and highly appreciated. So far 201 patients have been treated there, and at present no one in the prison is in need of immediate attention. Arrangements have also been made to call the assistant (by phone) to the prison at any time his services may be needed.

"From the foregoing it may be seen that I have the appliances and material as well as an assistant to do the work. He is now free every afternoon except Friday.

"I make the following proposition:

"(1) That permission be granted to commence the work in some one of the schools, Tondo for instance. That services be rendered to the children absolutely free of cost either to them, the municipality, or the government, on a system and plan which I will devise so as to accomplish the most good with the least interference with the work of the

school, and with a view of popularizing the work. As the instruments and the assistant would have to be transferred daily to his work at the school, it is recommended that a conveyance (caromatta or carotella) be furnished for this purpose by the Bureau of Health or the school department (but even this is not insisted upon), for four afternoons per week, Monday to Thursday.

"(2) In course of time the benefit derived by the people will become a substantial demonstrable fact, and at the same time it will be impossible to expect the amount of service required of the assistant at his present rate of compensation. The service will then either have to be abandoned, or arrangements made to continue it on one of the following two plans: (a) The matter to be brought to the attention of wealthy natives, who will advance the funds to secure a portable equipment and a moderate addition to the compensation of the assistant; or (b) the municipality or the government render financial aid. I am of the opinion that \$P.500 will be ample for the equipment, and \$P.600 expended annually would cover the cost of material, extra compensation of assistant, and in fact all expenses, as the work for these children would consist in the removal of roots of carious teeth, simple fillings of amalgam, gutta-percha, and cement, cleaning, treatment of diseases of the gums, and such other attention which does not call for an outlay of much money.

"AUTHORITIES.

"In closing this appeal for dental services to the poor and the coming generation, I cannot do better than briefly quote from the writings of others anent this important work:

"Neither the municipal authorities nor even the state should be kept in ignorance of what might be done in a cause of such vital importance to the people."⁽¹⁾

"The idea of reaching (in a dental sense) the public in an educative way through the public schools, we regard as excellent."⁽²⁾

"There are two reasons why I urge the es-

tablishment of free dental service for the sick poor. In the first place, because the poor are sadly in need of such service. In the second place, because dental practitioners should, to a larger extent than is now common, give some fraction of their time in public work of a purely charitable nature."⁽³⁾

"If the mouths of children in public schools could be examined by competent dentists, carious or diseased teeth filled or extracted, and instructions given and enforced in regard to the intelligent use of brushes and antiseptics, the death-rate of this country would be materially lessened, the percentage of illness much reduced, and a stronger and more vigorous race result."⁽⁴⁾

"A movement is on foot for a tooth-brush campaign among New York city school children. . . . By dental attendance upon the children, there is no doubt that the health of the pupils would be much improved."⁽⁵⁾

"The South Carolina Dental Association offers to send lecturers to the public schools to instruct children how to care for their teeth."⁽⁶⁾

"Strasburg started the free care of children's teeth in 1902, and Darmstadt, Mühlhausen, and other cities followed suit. The third annual report from Strasburg states that there were 12,691 visits to the clinic last year, and that the children are improving in the care they give their teeth."⁽⁷⁾

"The Milton, Pa., dentists have taken a step in the right direction, and are taking care of the teeth of the school children whose parents are not in a position to pay for dental work. Working alternately, by agreement among themselves, and requesting no compensation, they give one day a month to this task."⁽⁸⁾

"It is inconceivable to some minds that men who are really competent will devote time to dental inspections which do not promise a money return, and as no fee is paid, they think there is clear proof of base motives for the undertaking—that such inspections are only means for the advertisement of the dentists. This suspicion only proves that those who make such statements are absolutely incapable of comprehending the importance of such researches."⁽⁹⁾

"The city will buy the material and equipment. The work will be furnished by the Cleveland Dental Association, and 1500 children, whose parents receive aid from the city, will be entitled to free treatment. The reasons given for the innovation are that the

digestion, and consequently the health of the children, will be improved by good teeth." (12)

" . . . The need (free dental service in the public schools of Brooklyn) is widespread, as is understood when one realizes that 55,300 school children were examined from March to December last year, and 18,000 were found to have defective teeth. The percentage of children needing dental care was doubtless greater, as the medical examiner fails to discover conditions that a dentist would see." (13)

"Dental inspection has been introduced in the schools of Gleiwitz, Germany, and is now engaging the attention of the authorities of Berlin." (14)

"It is evident that bad teeth influence the health of the children, and that the health of the entire people suffers by the propagation of caries, if energetic measures are not taken against this disease." (15)

"In the examination of the teeth of 3183 National school children, I found 86 children, or 2.7 per cent. who possessed an entirely sound set of teeth; these children were between six and fourteen years of age." (16)

"The school should put itself in the service of sanitation. Everything a child learns at school is impressed most strongly on its memory. . . . In the interest of dental hygiene, it would be of great utility to appoint school dentists, who from time to time would examine the teeth of the children, and if desired, treat them gratis." (17)

"A novel bequest was recently made to be used to pay for the proper care of the teeth of school children in a village in England, in cases where the parents could not meet the expense." (18)

"In the year 1896 there was established the Mellin Foundation in Hamburg, a dental institute appointed in the most sumptuous style. In what manner its existence as a permanent foundation has been fixed, and what arrangements exist for the maintenance of its effectiveness as a charitable institution, I have no authentic information." (19)

"It is clear that the colossal spread of dental caries in all strata of the population carries with it a great danger to public health, and this fact cannot be emphasized too often and too loudly. . . . The carious teeth form breeding-places for the bacilli, which again may become the starting-point of various diseases, and finally, the child may suffer great torture through resulting toothache. . . . The disturbance of digestion, with all its consequent symptoms, is by far the

most important and frequent injury which is brought about by dental caries. . . .

"During every act of drinking and eating, rotten, decomposed masses proceed from hollow teeth and putrefied roots and penetrate into the stomach. . . . In the same way as the school is the only place where by dental examination of the children a true picture can be obtained of the general decay of the human teeth, so the school is the only place which is really effectual for the introduction of dental hygiene to the people." (20)

"And so on, *ad libitum*, could I quote authority after authority. I think the above is sufficient precedent to enable you to arrive at a decision in the matter. Before proposing it to you I have endeavored to interest others of my *confrères* in the work, and while I have their promise of hearty co-operation, I know from previous experience that I have not much to expect until successful results are shown, when I shall receive all the assistance I need.

"Very respectfully,

"LOUIS OTTOFY."

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10. *Ibid.*
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18. *Quarterly Circular* (Ash's), June 1898.
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The foregoing communication was acknowledged by the Hon. Secretary of Public Instruction, under date of December 22, 1906, as follows:

"With reference to your letter of December 3d, in which you present statistics and facts bearing upon the subject of introducing free dental service in the public schools of Manila, I have to inform you that the same was referred to the Director of Health and the Director of Education, who seem to take a favor-

able view of your proposition, but suggest that action be deferred until the arrival of a lady physician, who is expected here soon, as it is desired that she should have an opportunity first to make a medical report upon the schools."

The lady physician referred to is now (February 1907) making an examination of the school children, and I trust it will not be long before the work herein referred to is inaugurated.

OPSONISM APPLIED TO PYORRHEA ALVEOLARIS.

By G. S. JUNKERMAN, A.M., M.D., D.D.S., Cincinnati, Ohio.

THE multiplicity of remedies, the variegated aggregation of etiological opinions, and the continued chain of uninterrupted failures in the treatment of pyorrhea alveolaris, lead to but one conclusion—that dental surgery, backed by human intelligence, has not yet triumphed in the therapy of this not uncommon disease. Inspired by an article in the March number of the *International Journal of Therapy* and written by Dr. Otto Juettner, on the subject of "The Opsonic Question," I have presumed to think that a light has at last broken on our way, pointing to a natural explanation of the disease; and this in turn may lead to a curative therapy for it. This author's concise explanation of the "opsonic question" will be my apology for quoting freely from his article.

Fine-spun theories as to whether this disease be constitutional or local avail nothing unless we find that constitutional treatment is curative of it; since the only manifestation we have of it is a local one. When the teeth are gone the disease is gone. This is almost convincing evidence that local therapy will be the effective treatment. If a man have rheumatism in his toe, removal of the toe will not cure the disease except so far as the toe itself is concerned. It will appear somewhere else, because

rheumatism is a constitutional disease. Those who advocate the constitutionality of pyorrhea alveolaris have for their contention but a single leg on which it can stand, and that is the unavailability of local treatment.

To place the subject squarely before you in conjunction with the opsonic question, let us start with the hypothesis that pyorrhea alveolaris is a local infectious disease, being consequently of bacterial origin, the bacteria having been absorbed by the peridental membrane or selected by it from bacteria which have been taken into the blood in a constitutional way. The selective power of the peridental membrane for this particular kind of bacteria would be the only way that the disease could arise from the general circulation. This becomes the more positive in the absence of any constitutional symptoms, which so far have not been discovered. It is quite possible, also, that this particular kind of bacteria might upon examination be discovered in the general circulation, having been absorbed by the peridental membrane externally and being harmless to the other tissues of the body. The most rational conclusion, based upon the hypothesis assumed and fortified by the brief known etiology of the disease, is that if the disease be of a bacterial

origin, the bacteria are absorbed from without. This conclusion is doubly fortified and the selective theory of the peridental membrane is exploded from the fact of there being other membranes in the body similar to the peridental membrane which are never infected with this disease. Furthermore, these theories cannot be controverted, even if, when the correct therapy be discovered, our remedy shall be found to be most effectively administered constitutionally. Pyorrhea alveolaris is characterized by death of the peridental membrane through pus formation around it, and pus formation requires bacteria. The opsonic question has to do with the destruction of bacteria as antagonizing disease and its destructive tendency.

To quote from the author above referred to, "The pioneer work in this important department of biology was done by Metchnikoff, who studied the rôle which the white corpuscles of the blood play in the protection of the animal body against germs of disease and their destructive activity. Metchnikoff showed that the white corpuscles in reality are protectors and defenders of the body, inasmuch as they actually wage war against the intruding germs of disease, attacking and destroying them. He called them phagocytes (eating-cells), because they devour the invading bacteria. The process itself he called phagocytosis. This subject was taken up, studied, and elaborated by many observers, who elicited many new and interesting details. It was found that the fighting quality or eating capacity of the blood-cells is variable, and dependent upon many circumstances. The so-called phagocytes do not at all times possess the same degree of power to cope with pathogenic intruders. Sometimes their power is very slight; under other circumstances it is very considerable. If this power be so great that germs of disease can enter the body without being able to do harm, the body, as the result, is practically proof against their activity; this condition is called *immunity*. It represents the highest phagocytic power of the blood cells."

Under this condition it is quite possible that the bacteria producing pyorrhea alveolaris may be present in the mouth and yet no infection take place, because of the high opsonic index of the individual—or of the membrane, if the disease be entirely a local one. This would constitute a condition of immunity.

To quote further, Leishman, Wright, Douglass, Bulloch, and others studied the subject of phagocytosis from many points of view. It was elicited that the fluids of the blood themselves possess certain properties that affect the phagocytic action of the blood-cells. Wright used for his earliest experiments the cultures of one of the pus-producing germs, the staphylococcus pyogenes aureus. He attributed the peculiar effects observed to the action of certain elements contained in the blood fluids. These elements modify the bacteria, weaken them, and in this way render them a ready prey to the phagocytes. Since the bacteria are devoured by the phagocytes, the action of the elements in the blood fluids is similar to the function of the cook who prepares the food for eating. In this case the bacteria are the food. The cook is represented by the elements in the blood fluids which modify the bacteria, or render the food eatable. These elements in the blood fluids were for this reason called *opsones* or *opsonins*. The Greek word ὀψων means a "side dish." The verb ὀψωνέω means "to provide food" or "to prepare food." Thus the meaning of the word "opsonin" becomes plain.

Ross, in a splendid monograph on the subject, summarized the matter as follows:

"(1) Opsonins act by chemically uniting with the invading bacteria, and so altering them that leucocytes are able to *phagocyte* the bacteria and destroy them. It is important to remember that these substances do not stimulate or otherwise affect the leucocytes.

"(2) It is probable that there are present many varieties of opsonins in the blood plasma, each having to do with combating a particular kind of microbic invasion.

"(3) Opsonins have been shown to be distinct from other bacteriotropic substances, such as bacteriolysins, the agglutinins, and antitoxins."

The comparative estimation of a patient's power of resistance to an invasion of a given germ is called the "opsonic index" of the patient. To find the opsonic index of a patient for any given microbe, the serum to be tested is mixed with fresh human leucocytes and the mixture observed in its action upon the particular bacterium under investigation. This opsonic index assumes practical importance because it seems to bear a definite relation to an individual's resistance against a given disease-producing microbe. With subacute and chronic infections the opsonic index is usually low for the corresponding bacterial species.

Wright has shown that by artificial bacterial auto-inoculation one may increase resistance against the corresponding organism to a point at which the healing of infectious processes occurs. The bare fact that immunity could be induced or heightened by the use of pathogenic bacteria or their products had been established and extended from the day of Pasteur's epoch-making studies in the bacteriology of infectious diseases; and from Buchner's day it was shown that the blood serum bore an important part in the body's combat against micro-parasites; while the rôle of the living body-cell was demonstrated by the brilliant Metchnikoff. But figuratively it remained for Wright to so modify the vaccine of Pasteur as to arouse in the serum of Buchner a substance which prepared the disease-producing microbe for destruction by the phagocyte of Metchnikoff; thus bringing to practical humanitarian usefulness the laboriously studied theories of three pioneers in biologic therapy. (Ohlmacher.)

The chief and only object in the treatment is to *raise the opsonic index*.

Wright's method is limited to bacterial infections, and is most favorable in those cases having a low opsonic index. For the sake of illustrating the plan, let us assume that we have to treat a case of pustular acne: The first thing to do is to

examine the pus to determine the organism present. Next find the patient's opsonic index. If it be low, vaccine inoculations should be made. A vaccine as it is understood here is a standardized, sterile emulsion of the organisms found in the pus of the lesion. Under aseptic precaution inject into the patient a vaccine of two hundred and fifty million cocci. When this is done it becomes very interesting to observe what now takes place in the patient. Immediately following the injection there is a fall of the opsonic index, but a reaction soon takes place and the index begins to rise, and within from four to six days the index will reach the normal and will go above it, remaining stationary for a few days, when it will begin to fall again. The curve will graphically represent the exact conditions. The falling index is called the "negative phase," the increasing index is called the "positive phase," and the stationary condition is called "high tide." The patient's blood is kept under examination, and when the second "negative phase" appears and the index is returning to normal, another inoculation with vaccine should be made. The index continues to fall after the second injection is given, but reaction soon follows, and the index shoots up again, and probably higher than before, remains stationary, then begins to fall. In such cases an inoculation should be made about every ten days, but in all cases they should be controlled entirely by the index. After a few inoculations, as a rule, marked improvement will be observed in the patient.

The preceding statements are quoted from a summary of the subject by J. M. King of Nashville.

Wright's fundamental rules for therapeutic applications in cases of bacterial infections are—

- (1) Isolate in pure culture the causative micro-organisms.
- (2) Estimate the opsonic power of the patient's blood to this micro-organism.
- (3) If the opsonic index be at or below normal, prepare and standardize a vaccine from this micro-organism.

(4) Inoculate the patient with this vaccine with appropriate doses and at proper intervals, as shown by a systematic estimation of the opsonic content of the patient's blood.

What the influence of Wright's attractive and ingenious theory will be on the therapy of bacterial diseases, it is as yet too early to tell. In the light of his researches the *vis medicatrix naturæ* ceases to be a theoretical abstraction or a convenient generalization. It becomes a physical entity accessible alike to the chemist, the pathologist, and the bacteriologist. Strangely enough, the brilliant work of two such master-minds as Metchnikoff and Wright bears out the truth of a statement of a humble layman, who more than sixty years ago said that all contagious diseases contain in their contagion the materials necessary for their cure. That humble layman was Vincenz

Priessnitz, the crude father of modern hydrotherapy.

From these suggestions it is but a step to associate pyorrhea alveolaris with a condition where the low opsonic index prevails in the peridental membrane. If such be the case the cure would be elevation of the index. Can that be done with drugs? It has been repeatedly tried without success, except of a temporary nature. Could a vaccine serum be made from the products of the disease itself and injected, so as to raise the opsonic index? It is well worth the trial, since all else has so dismally failed.

The opsonic question being one of such recent birth, its possibilities cannot yet be determined; but we believe that, if the discoveries so far made are correct and are applicable to the disease, we will find it a wonderful aid in the treatment, and possibly the long-looked-for cure, of pyorrhea alveolaris.

PHARMACOPEIAL REVISION.

By EDWARD HOFFMEISTER, A.B., D.D.S., Baltimore, Md.

(Read at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, D. C., June 7, 1906.)

THE need to compile and formulate a National Pharmacopeia must have been apparent long before 1820, in which year the first United States Pharmacopeia, projected and fostered by Dr. Lyman Spalding of New York city, made its appearance. The necessity of standardizing drugs and their preparations, and the reliance to be placed upon such systematized manuals is evidenced in that prior to this time the various European pharmacopeias were depended upon by the physicians and pharmacists of this country.

A common misconception of the scope of the Pharmacopeia consists in the belief that an official drug, i.e. one receiving pharmacopeial recognition, must

necessarily be therapeutically efficient. Efforts have been made to include those drugs only whose accredited virtue is accepted and utilized by the great majority of practitioners, but it has been deemed wise to retain the representative character of the work.

The idea that framers of a pharmacopeia keep in mind is not to determine the value or inertness of a drug, but to see that the prescribed or purchased article is dispensed pure and that uniform preparations of the same may be obtained.

Dr. H. C. Wood, president of the United States Pharmacopeial Convention, explains the *motif* of a pharmacopeia thus: "If five thousand doctors in

the United States believed brickdust to be a valuable remedy and habitually used it, brickdust would have to go into the Pharmacopeia. Witch-hazel is probably as active and as useful as is brickdust, but witch-hazel is a fad and is enormously called for, and so witch-hazel must go into the Pharmacopeia. The Pharmacopeia exists for the purpose of requiring the apothecary to give, in the first place, pure brickdust or pure witch-hazel when asked for; and in the second place, uniform preparations of these remedies."

A revision of the Pharmacopeia has been effected every ten years since the publication of the initial volume, through the efforts of a committee of revision, which is elected from the members of the Pharmacopeial Convention, which is composed of delegates from the incorporated medical colleges, medical societies, colleges of pharmacy, pharmaceutical societies, the American Medical Association and the American Pharmaceutical Association, and representatives of the national government, selected by the Surgeons-general of the Army, the Navy, and the Marine Hospital Service.

Although the work is not issued under governmental authority, differing in this respect from the pharmacopeias of other countries, yet it has been accepted as the legal standard for drugs by at least half the states, and whenever a "pure drug bill" is submitted, pharmacopeial purity is universally understood. The conventions and their revision committees have been composed of representative members of the professions of medicine and pharmacy, and their broad knowledge and untiring labors, with no other motives than their interest in higher standards, give the work greater value and stamp it with dignity.

The last or "eighth decennial revision," which became official in September 1905, is characterized by important changes, all of which the scope of this paper and the time allotted forbid me to recite.

I will, however, point out the main general innovations, and lay particular

stress upon those individual changes that are of dental import.

(I.) NOMENCLATURE

Many salutary changes in the terminology of drugs have been made. A large number of synthetic remedies have been admitted under names expressive of their chemical composition; thus aristol has been made official as *Thymolis Iodidum*, which clearly shows its chemical nature, and phenacetin as *Acetphenetidinum*, designating its membership in the phenetidin group.

Some medicaments revel in the possession of five or six commercial names, descriptive of some therapeutic effect, and prescribers ignorant of these synonyms have upon receiving adverse results with it under one trade name, unwittingly ordered the same article under another. Such drugs have received official recognition under names approximating their true chemical composition, some of which titles, although unwieldy and necessitating abbreviations, are nevertheless specific.

Some synthetic products extensively used could not be admitted, owing to the decision of the convention that "No compound or mixture shall be introduced if the composition or mode of manufacture be kept secret, or if it be controlled by unlimited proprietary or patent rights." Oftentimes remedies possessing trade or registered names are sold to the pharmacist, and through him to the patient, at an unreasonably high price. Its incorporation in the Pharmacopeia not only avoids this, but establishes its chemical composition and its purity.

An effort has been made to eliminate synonyms, and to further this end it is urged that prescribers and pharmacists use the Latin or English pharmacopeial title exclusively. This is worthy of emphasis. To avoid confusion, by its alphabetic separation from "Extractum," the "Extractum fluidum" of the U. S. P. 1890 has been changed to *Fluidertractum*.

Of special dental interest are the following changes in official titles:

U. S. P. 1890.

U. S. P. 1900.

Acidum Arsenosum	Arseni Trioxidum.
“ Chromicum	Chromii Trioxidum.
“ Carbolicum	Phenol.
Amyl Nitris	Amylis Nitris.
Argenti Nitras Dilutus	Argenti Nitras Mitigatus.
Chloral	Chloralum Hydratum.
Cocainæ Hydrochloras	Cocainæ Hydrochloridum.
Ferri Oxidum Hydratum	Ferri Hydroxidum.
Ferri Oxidum Hydratum cum Magnesia	{ Ferri Hydroxidum cum Magnesii Oxido.
Glyceritum Acidi Carbolici	Glyceritum Phenolis.
Naphthol	Beta-naphthol.
Petrolatum Molle	} Petrolatum.
“ Spissum	
Salol	Phenylis Salicylas.
Spiritus Glonoini	Spiritus Glycerylis Nitratis.

(II.) PURITY AND STRENGTH.

The eighth decennial revision has adopted what is termed the “purity standard” or “purity rubric,” which states the percentage of permissible impurities, having no essential effect on medicinal action nor interfering with pharmaceutical uses.

Upon the recommendation of the “International Conference for the Unification of the Formulas of Heroic Medi-

cines,” held at Brussels in 1902, many changes in the strength of preparations have been made.

The strength of fluid extracts, viz, 1 c.cm. representing the active virtues of 1 gm. of the drug, has been retained.

The disposition toward greater uniformity in the strength of tinctures is shown in that all, with few exceptions, are now either 10 or 20 per cent.

The noteworthy changes from a dental viewpoint are as follows:

TITLE.	CONSTITUENT.	U. S. P. 1890.		U. S. P. 1900.	
Acidum Sulphuricum					
Aromaticum	H ₂ SO ₄ by weight	About 18.5	per ct.	About 20	per ct.
Alcohol	C ₂ H ₅ OH “ “	“ 91	“ “	“ 92.3	“ “
Alcohol Dilutum	C ₂ H ₅ OH “ “	“ 41	“ “	“ 41.5	“ “
Extractum Opli	Morphine “ “	18	“ “	20	“ “
Liquor Ferri Chloridi	Anhydrous Fe Cl ₃	37.8	“ “	29	“ “
Pulvis Opli	Morphine by weight	13-15	“ “	12-12.5	“ “
Spiritus Frumenti	C ₂ H ₅ OH “ “	44-50	“ “	37-47.5	“ “
Tinctura Aconiti	Aconite	35	“ “	10	“ “
Tinctura Belladonnæ					
Foliorum	Belladonna Leaves	15	“ “	10	“ “
Tinctura Digitalis	Digitalis Leaves	15	“ “	10	“ “
Tinctura Opi	Morphine by weight	1.3-1.5 gm. in 100 c.cm.		1.2-1.25 gm. in 100 c.cm.	
Tinctura Veratri	Veratrum	40 per cent.		10 per cent.	

(III.) DOSES.

A commendable departure consists in the insertion of average approximate doses given in the metric system with their apothecaries' equivalents, in obedience to the suggestion of the convention, with the specification that "Neither this convention nor the committee of revision created by it intends to have these doses regarded as obligatory on the physician or as forbidding him to ex-

honed; while to avoid the administration of inert ingredients and establish greater uniformity and certainty in action, the chief active constituents of many drugs have received pharmacopæial recognition.

Some combinations of drugs which have been used extensively under various trade names have been made official, their composition fixed, and the purity of their ingredients assured.

The following additions may be cited:

LATIN TITLE.	ENGLISH TITLE.	SYNONYM.
Acetphenetidinum	Acetphenetidine	Phenacetin.
Acidum Trichloraceticum	Trichloracetic Acid.	
Aethylis Chloridum	Ethyl Chlorid.	
Antipyrina	Antipyrine.	
Benzosulphindum	Benzosulphinide	Saccharin.
Cocaina	Cocaine.	
Codeinæ Phosphas	Codeine Phosphate.	
Codeinæ Sulphas	Codeine Sulphate.	
Cresol	Cresol.	
Eugenol	Eugenol.	
Iodolum	Iodol.	
Sulphonmethanum	Sulphonmethane	Sulfonal.
Thymolis Iodidum	Thymol Iodide	Aristol.
Liquor Formaldehydi	Solution of Formaldehyde.	
Phenol Liquefactum	Liquefied Phenol.	

Liquor Antisepticus.—Containing 2 per cent. of Boric Acid, 0.1 per cent. each of Benzoic Acid and Thymol; 25 per cent. of Alcohol with Eucalyptol and oils of Peppermint and Gaultheria.

Pulvis Acetanilidi Compositus.—A mixture of Acetanilid, Caffein, and Sodium Bicarbonate.

ceed them whenever in his judgment this seems advisable."

The establishment of an official average dose fills a long-felt want, when the variability in dosage as evidenced by the result obtained by different investigators is considered.

(IV.) ADDITIONS.

A comparison of the present revision with the last reveals the fact that 117 additions have been made. This number includes many synthetic remedies which were placed upon the market and were favorably received.

To facilitate solution and insure stability, salts of familiar drugs have been

(V.) DISMISSALS.

With every revision it is found advisable to exclude drugs and preparations because they have become obsolete, or for some other good reason.

In the list, comprising 151 articles, which have met this fate at the hands of the last committee of revision, there does not appear one of any dental importance.

(VI.) ASSAYS.

A feature which distinguishes our Pharmacopœia from all others is the large number of contained assay processes. The value of assays can readily be appreciated if we consider that prior

to their introduction the purity and strength and resulting therapeutic efficacy of drugs were determined largely by their physical appearance. There could neither have been that uniformity in strength nor certainty in action which characterizes the major portion of the present official drugs and preparations.

In addition to the changes enumerated many alterations have been made in the manufacture of preparations and in the methods for the determination of the identity and purity of official articles, which are of greater interest and importance to the pharmacist than to the prescriber.

I have taken for granted, in this brief review of changes made in the eighth revision of the Pharmacopeia, that you are all familiar with the book itself. Do we, as dentists, sufficiently appreciate its practical value? Has not its worth been thoughtlessly disregarded by the great majority of the members of our profession? In our eagerness to perfect operative and prosthetic technique, are we not prone to overlook another branch of dental practice—the use and administration of medicines? Are not pathological conditions presented to us which are in our province to correct by medication, and the treatment of which our *clientèle* rightfully expects from us? How, then, can we render intelligent service if we are not conversant with the physical properties, physiological action, toxicology, etc., of the comparatively small number of agents necessary?

Granted that the advanced and wholesome tendency is toward reduction in the number of drugs and simplicity in their combinations, is not the reasoning more potent that the smaller number be more carefully studied and their purity and strength insisted upon? In our employment of medicaments are we not inclined toward empiricism instead of rationalism? How many of us consider the purity and strength of our remedies, and can detect adulterants by applying suitable tests? And yet, is it not urgent that we so select and know our agents that we can the more safely rely upon their action? Should we not then learn, use, and prescribe *official* articles of established and standardized potency and purity? These are some of the questions which naturally arise when the subject of dental medication is considered.

A logical, indisputable inference is that, if drugs be used, it is our duty to our patients, to our profession, and to ourselves to obtain all available knowledge of their physical attributes, action, purity, and strength.

In conclusion, permit me to urge a closer communion with the United States Pharmacopeia, to give it the support which is so often denied it but which it richly deserves, and to express the hope that the Pharmacopeial Convention of 1910 may have as representatives of the dental profession, if not delegates from the various colleges and state and district associations, at least members from the National Dental Association, through whom matters of peculiarly dental importance can be submitted.

METHOD OF CONSTRUCTING CROWNS FOR THE ANTERIOR TEETH.

By CHESTER A. BAKER, D.D.S., Washington, D. C.

(Clinic given at the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, June 7, 1906.)

MY idea is to do away with the band on the labial portion of the root when crowning the anterior teeth. The Richmond crown has a band passing around the entire circumference of the root just under the free margin of

way as for the ordinary Richmond crown, and then the notch is cut. A piece of 24-karat gold about No. 32 gage is then soldered to a platinum-iridium post, placed on the root, and burnished first to the notched surface. (Fig. 2.) It is

FIG. 1.

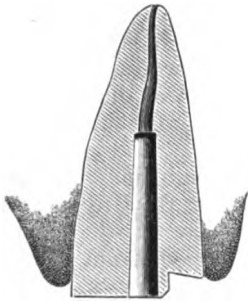


FIG. 2.

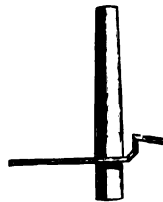


FIG. 3.

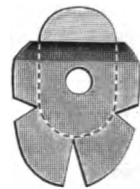


FIG. 4.

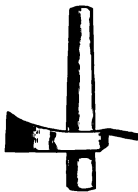


FIG. 5.

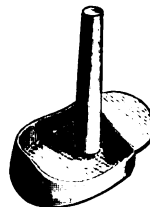


FIG. 6.



the gum, and it is the anterior portion of this band which is objectionable, causing recession of the gum, etc. The principal feature of my method is a notching mesio-distally of the anterior face of the root about half way anteriorly to the root-canal opening. (Fig. 1.)

The root is first prepared in the same

then removed and that portion stiffened with solder. The portion covering the posterior surface of the root is then split so as to allow the surplus gold to be turned up and burnished, thus forming the band. (Fig. 3.) After the cap has been thoroughly burnished to the root, it is removed and invested in a little

whiting, and solder is flowed so as to stiffen it and also to reinforce the portion which forms the band. (Figs. 4 and 5.)

By this method all the advantages of a full-banded crown are available, and the disadvantage of gold showing above the porcelain on the anterior portion of the root is obviated. The operator can

thus form a cap which absolutely fits the face of the root and to which a facing can be attached as in the ordinary Richmond crown. The notch across the face of the root may be cut very easily with a sharp inverted-cone bur. The cap may be made of platinum and the rest of the crown completed with porcelain in the usual way.

ANTISEPTICS AND DISINFECTANTS.

By C. L. CONSTANTINI, D.D.S., Washington, D. C.

(Read before the union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, Washington, June 7, 1906.)

THE object of this paper is to call attention to, or rather to stimulate the minds of the profession concerning, the antiseptic and disinfecting agents of some few years back, and those of the present time, together with a brief description of disinfection in general.

Disinfection is the destruction of the agents causing infection. An object is said to be infected when contaminated with disease-producing living principles, namely, pathogenic micro-organisms. A tissue is disinfected by destroying these organisms, whether they exist in the substance, or on the surface of a tissue. As a matter of fact it is not necessary actually to destroy the infective agents; it is sufficient to render them incapable of causing or conveying disease. For example, if the micro-organisms are so attenuated that they have lost their virulence; or if they are so scattered that they are too few to cause infection, the object of disinfection has been accomplished, of course. Dilution, attenuation, and the like fortuitous circumstances cannot be depended upon by the disinfecter. He must use means that will surely destroy the infectious principles. The only way an infected object may with certainty be rendered incapable of conveying disease is by the intelligent ap-

plication of physical means or chemical substances which experiment or experience have shown will invariably destroy the infection. The ideal disinfectant is the one that destroys the germs without injury to the object; there is some one agent or method applicable to each case. It is therefore necessary to determine accurately all the conditions, not only of the object to be disinfected, but of the germicide to be used, and to take into account the resistance of the particular morbid principles against which the disinfection is directed. Disinfection, then, deals only with the destruction of the vitality of those minute forms of life which cause disease; it does not mean the destruction of all the lower forms of animal and vegetable life that may be upon or in an object—that is sterilization.

An object is said to be sterilized when all the forms of life contained within it or on its surface are destroyed. All processes which sterilize are necessarily also disinfectant; but all disinfecting processes are by no means processes of sterilization. This distinction between disinfection and sterilization arises principally from the fact that some of the micro-organisms have spores which correspond to the seeds of plants, in being

much more resistant to all the influences which destroy the parent cells. Spores of this character, called endogenous spores, possess to a very high degree the power of resisting desiccation, sunlight, chemical and physical agents which quickly destroy the non-spore-bearing cell. Fortunately, as far as known, none of those pestilential diseases of man which occur in widespread epidemics, are caused by organisms with resistant spores; therefore the usual processes of disinfection, while thoroughly efficient, may still leave many harmless and hardy bacteria alive. In other words, sterilization is rarely necessary in combating epidemic diseases.

Antiseptic substances prevent decomposition and decay; such substances retard the growth and activity of micro-organisms, but do not destroy them. There is a great difference between the antiseptic and the disinfecting or germicidal value of a substance; for instance, a solution of formalin will restrain the development of most bacteria in the proportion of 1:50,000, but it requires a 3 to 5 per cent. strength of this substance to kill the bacteria in a short time. As weak a solution of mercury bichlorid as 1:300,000 will restrain the development of anthrax spores; whereas it requires a 1:1000 solution to destroy them. Saturated solutions of salt or sugar will preserve meat or vegetable substances; that is, they are antiseptic in their action, but not germicidal, as they have small powers of destroying germs. Germicides and disinfectants are interchangeable terms, as both serve to indicate the destruction of micro-organisms.

The best disinfectants, where they can be applied, are steam and boiling water. There are some particular objections to them, however, on account of the difficulty of always obtaining them in a convenient place, and of the injury to the walls of a room, articles of furniture, bedding, clothing, etc., resulting from their use. Hence, disinfectants which are more conveniently applied, and do not injure materials with which they are brought into contact, are preferable.

Some of the *disinfectants* in use are as follows: Carbolic acid. Formalin.

Carbolate of lime. Hydronaphthol. Resorcin. Solution of chlorinated soda. Charcoal. Creasote. Zinc chlorid. Hydrochloric acid. Nitric acid. Sulfuric acid. Phénol sodique. Potassium permanganate.

Some of the *antiseptics* are as follows: Carbolic acid. Creasote. Salicylic acid. Oil of eucalyptus. Iodoform. Benzoic acid. Boric acid. Pepsin. Bromin.

Besides these there are a good many mouth-washes on the market, with which you are all probably familiar.

Carbolic acid. Though many new disinfectants have been recommended in its place, carbolic acid, so long known, has retained its position as one of the best disinfectants in surgical work, as well as for general purposes.

Used in solutions varying from one-half of one per cent. to five per cent. in strength, it is a valuable destroyer of all disease germs, when there are no practical objections to its employment. Its odor and poisonous properties are sometimes objectionable. Kuppe and Laplace found that crude carbolic when treated with sulfuric acid gave a product the disinfecting properties of which were increased if mixed with cold water, but decreased if mixed with warm water. If this mixture is to be used, it should be prepared by stirring the sulfuric acid slowly into the carbolic acid, with a wooden paddle, in a wooden or iron receptacle. Fränkel found that when crude carbolic acid was distilled, it yielded a product boiling between 185° and 205°, which in a 5 per cent. solution killed anthrax spores (among the most difficult ones to destroy) in twenty-four hours. Treated with sulfuric acid the cold solution again showed stronger disinfecting properties than the warm, which was supposed to be due to the fact that the sulfo-acids formed had weaker properties as disinfectants. Subsequently others succeeded in dissolving cresols and crude carbolic, etc., in various soap solutions. Creolin, lysol, cresolin, cresin, etc., less expensive than the original compounds, were offered as substitutes for carbolic acid, all being solutions in resin soap of the cresols and similar hydrocarbons.

Formalin. Concerning formalin, the results of all investigations have led to the following conclusions:

(1) Formalin, in concentration 1:10,000, makes the growth of tuberculosis, anthrax, chlora, typhus, pus, and diphtheria germs impossible.

(2) In a gaseous form a weak dilution is sufficient to check growth.

(3) A 1 per cent. solution will kill pathogenic organisms in an hour.

(4) With a 3 per cent. solution and final addition of alcohol it is possible to make the hands germ-free; whether the skin of the hands is attacked by this method remains to be proved.

(5) Spraying with formalin solution and subsequent inclosure of the article in a closed space will readily sterilize them. As compared with other disinfectants such as corrosive sublimate, carbolic acid, lysol, etc., formaldehyd and its solutions have the advantage of not being retarded in their action by albuminoid matter, and of not injuring the articles to which they are applied. Their use, therefore, seems to be well recommended to fill many requirements which are not now fully met by other disinfectants. Hydrogen dioxide is an agent upon whose value a great diversity of opinion exists, especially in so far as its use as a mouth-wash is concerned, particularly on account of its acidity. I would appreciate a discussion on this point, as it has been my experience—although I have never recommended its use by the patient himself—to find the saliva of about the same reaction after its use as before it.

A few of the early applications in inflammatory conditions of the mouth, as advised and used by early practitioners of dentistry, are as follows:

(1) Silver nitrate or muriatic acid, with an alternate wash of honey or borax, equal parts.

(2) Chlorinated lime applied dry to an ulcerated surface twice daily, and simple water used during the interval.

(3) Solution of borax 15 gr. to 1 oz. of water.

(4) Weak solution of silver nitrate 1 gr. to 1 oz. of water.

(5) Copper sulfate 5 gr. to 1 oz. of water.

(6) Zinc sulfate 1 dram to 1 oz. of water, to which is added 2 drams each of honey and tincture of myrrh.

(7) Copper sulfate 2 drams, pulverized cinchona $\frac{1}{2}$ oz., and 4 oz. of water.

(8) Powdered nutgall and Peruvian bark 2 drams each. Infusion of roses 4 fl.oz.

(9) Borax 2 scruples, honey 1 fl.oz., and sage tea 4 fl.oz. This last one, I have been told, was very popular, and even today is used a great deal.

(10) Another formula of the gunshot type is as follows:

R—South American soapbark, 8 ounces;

Pyrethrum,	
Orris root.	
Benzoic acid,	āā 1 ounce;
Cinnamon,	
Tannic acid,	4 drams;
Borax,	4 scruples;
Oil of wintergreen,	2 fl.ounce;
“ “ peppermint,	4 “
Cochineal,	3 drams;
White sugar,	1 pound;
Alcohol,	3 pints;
Pure water,	5 pints.

Sig.—Mix the ingredients thoroughly, digest for six days, and filter.

A table of antiseptics as prepared by Dr. W. D. Miller, professor of operative and clinical dentistry in the University of Berlin, in reference to the relative powers of the materials experimented upon, here follows:

Mercury bichlorid	.....1:100,000
Silver nitrate	.....1:50,000
Hydrogen dioxide	.....1:8,000
Iodin	.....1:6,000
Iodoform	.....1:5,000
Naphthalin	.....1:4,000
Salicylic acid (crystals)	1:2,000
Oil of mustard	.....1:2,000
Benzoic acid	.....1:1,500
Potass. permanganate	....1:1,000
Eucalyptus	.....1:600
Carbolic acid	.....1:500
Hydrochloric acid	.....1:500
Sodium biborate	.....1:350
• Arsenous acid	.....1:250
Zinc chlorid	.....1:250
Lactic acid	.....1:125
Sodium carbonate	.....1:100
Listerine	.....1:20
Alcohol	.....1:10
Potassium chlorate	.....1:8

PROCEEDINGS OF SOCIETIES.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Twelfth Annual Union Meeting, Washington, D. C., June 7-9, 1906.

THURSDAY—*Morning Session.*

THE twelfth annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society was held in the lecture hall of the Dental Department of the George Washington University, Washington, D. C., June 7, 8, and 9, 1906.

The first session was called to order at 10 o'clock Thursday morning, June 7th, by Dr. H. M. Schooley, chairman of the committee of arrangements.

The Rev. Frank Sewall, Washington, opened the meeting with prayer.

The first order of business was the reading of an address by Dr. D. N. Rust, president of the District of Columbia Dental Society, Washington, D. C., as follows:

PRESIDENT'S ADDRESS.

It is not only my duty but my great pleasure to welcome you to this the twelfth union meeting of the Maryland State Dental Association and the District of Columbia Dental Society. In doing so, I find myself confronted by the same ideas and emotions that will have been twelve times expressed on these occasions, and therefore I ask your indulgence.

Lord Bacon says, "Every man owes a debt to his profession." This is especially applicable to our profession, and it is for the purpose of trying to partially repay this debt that we meet on these occasions—to discuss the allevi-

ation of human pain and the improvement of human health, and to compare notes on the countless problems that daily confront us. This means has been found in our local, state, and national societies. Here we assemble for mutual improvement and mutual help, and for what is of equal, if not greater importance, to cultivate that fraternal fellowship which engenders a feeling of respect and confidence such as should exist in all professions, and especially in ours.

There is, however, one special feature which exceeds those I have just named as the *raison d'être* of our existence, which appeals to me, and that is, by your presence we learn that there are many others besides ourselves who are striving along the same lines that we are striving; who are facing the same difficulties that we face; who are solving the same problems that we must solve, and above all, who have ever before them the same high ideals that we have. This gives us courage to press on, and ever on, toward the goal of our ambition, attempting—and oftentimes reaching—the seemingly impossible.

Much good has been accomplished by these union meetings, and so firmly has the custom of holding our meetings together become fixed, that it would be well-nigh impossible to hold a dental meeting in Washington without the co-operation of our professional brethren from Maryland. In connection with this, we shall not fail to see that this meeting forms a preliminary step to that

of the National Dental Association, to be held in Atlanta in September 1906.

An interesting and well-filled program has been arranged, and I take this opportunity of thanking those who have kindly consented to give us a paper or clinic, as well as the various committees in charge. To each and every one of our friends and visitors I extend, both personally and in the name of the District of Columbia Dental Society, a hearty welcome.

Dr. SCHOOLEY. I have great pleasure in announcing that Dr. H. E. Kelsey, president of the Maryland State Dental Association, will respond to the address of welcome by Dr. Rust.

Dr. KELSEY then responded to the address of welcome as follows:

RESPONSE TO PRESIDENT'S ADDRESS.

The Honorable President of the District of Columbia Dental Society, guests and members of the Union Meeting: In responding to the cordial welcome of the District of Columbia Society through its president, I feel as usual my inability to adequately express the sentiments which inspire me upon every occasion of our meeting together for pleasure or mutual instruction, or, as upon this occasion, for both.

However, a few simple words spoken in sincerity often prove a better medium through which to convey ideas and sentiments than great eloquence which does not ring true, and what I have to say at least comes from the heart. Speaking for all those who shall attend this meeting, I desire most warmly to thank the District of Columbia Society and you, Mr. President, for the cordial and hearty welcome you have extended to us.

For the three days of this meeting we shall consider ourselves at home, and ere the time is past we hope to convince our Washington friends that we have as fully accepted and enjoyed their cordial hospitality as they have freely offered it. But though the Maryland Dental Association is the guest of the District of Columbia Dental Society, she is not the guest of the union meeting, and we

are here to aid and assist shoulder to shoulder with the District of Columbia Dental Society in doing what remains to make this occasion memorable in the annals of dentistry, and with the hearty and able support of our friends and guests who are or will be with us, we shall surely accomplish this. . . . Our committees have worked untiringly toward this end, and notwithstanding the large demand upon the talent of the profession just at this time—when numerous meetings are being held—they have secured the presence of men whose names are known around the world, who will give us the result of their research and experience, thus adding to our instruction and entertainment.

I am sure the committees desire to thank all those who shall contribute to the success of the meeting, either by clinic, paper, or discussion, or merely by their presence.

But we have not worked solely for the success of this meeting. The upbuilding and advancement of our societies, and through them our profession, have been and ever should be the great objects which carry us through the tiresome detail of organization.

Much remains to be accomplished; dentistry as a profession is still in the evolutionary stages, and despite the remarkable progress which has been made in the past, it will be said of it a decade hence, as it is said today: "What wonderful progress has been made in dentistry in the last ten years!"

Fellow members, let us be up and doing, with a patriotic zeal worthy the cause, so that our societies may be among those that shall go down in history as having produced great men, methods, and principles.

It is scarcely proper for me to take advantage of the opportunity which my position offers to impose upon you the discussion of matters which do not pertain directly to this meeting, but the occasion is auspicious, and I cannot refrain from bringing to your attention a matter which is, or should be, of vital interest to every dentist and dental society, especially in the East and South. I re-

fer to the projected Jamestown Dental Convention. The Maryland Dental Society has been asked by Dr. Burton Lee Thorpe and his associates who have the matter in charge to join its efforts with theirs next year, and merge its annual meeting with the convention, and I have no doubt that the same invitation has been extended to the District of Columbia and other dental societies. It seems to me that we should give our heartiest support toward making this convention a credit to the profession and a conspicuous mark in the history of dental progress.

I cannot bring myself to close my remarks without congratulating the District of Columbia Dental Society upon its good fortune in having for its chief executive one whose steady virtues of professional honesty and faithfulness, both to his patients and associates, have made him beloved by all. And all the members of committees of both societies, who have so faithfully labored toward the success of this union meeting, I commend to their own good consciences as their best reward.

And now, Mr. President, permit me to extend to you, and to the District of Columbia Society, and to our guests, the greetings and fraternal regard of the Maryland State Dental Association.

Dr. Schooley then resigned the chair to Dr. Rust, president of the District of Columbia Society.

The societies then adjourned.

Afternoon Session.

The meeting was called to order by Dr. Rust at 4.30, for the purpose of discussing the clinics which were given during the afternoon.

CLINICS.

Dr. W. E. DIEFFENDERFER, Washington, D. C. "Difficult Impressions."

These are taken in sections as follows: Make an approximate model from a modeling compound impression. Reinforce the model over the ridge and teeth

with a brush. This applies the plaster evenly. On this construct a special cup. Build from the back on the model thus made gutta-percha base-plate over the ridge, bringing it up between the teeth and ending with a flat surface, so that the impression will part at these planes. This makes the inside section of the cup. For the outside section a piece of paraffin wax is molded over the model so as to allow a bulk of plaster that can be handled when separated. This cup will exactly suit the case.

The cup is scored on the under side to allow for the attachment of the plaster. Fill the cup and allow the plaster to set hard. Peel off the wax, and over the teeth make an incision with a thin-bladed instrument inserted between the gutta-percha and plaster at the flat planes of the cup. Remove the front section, which will allow the back section to be removed in one piece; when placed together they make a perfect impression, no matter how many undercuts there may be.

Discussion.

Dr. M. F. FINLEY, Washington. I did not see Dr. Dieffenderfer's clinic, but he has explained his method very clearly. My only thought on his procedure is that any partial plate constructed on a perfect die or cast for a mouth where the remaining teeth are at different angles would not fit such a mouth accurately. Any partial plate, in order that it should fit the mouth, must of necessity pass beyond all points of contact in going to place, and as perfect an impression as possible of the outer ridge between those teeth is an indispensable requisite. If a plate be made after such a model as he recommends, it would never fit the mouth, and unless he slides it in from behind forward, it would not remain in place. For partial metal plates, I do not see the necessity of having such a perfect model in all cases. Every plate must pass in and out around those teeth, so that if an impression be taken with modeling compound, it will be as near perfect as one might wish. I placed a plate in a mouth this morn-

ing from which there was considerable trouble in obtaining a perfect impression; but eventually I took an impression, made a cast, fitted a wax plate, and set the teeth on the wax plate. I moved that wax plate with the teeth on it in and out of the mouth. Where it came in contact with the teeth remaining in the mouth I trimmed it, so that it was possible to place it in and to remove it readily. If you want a perfect impression for exhibition purposes, the clinician's plan is all right, but for actual work, the plate to be of any service must easily slide over all the points of contact.

Dr. H. C. THOMPSON, Washington. Those who profess to do perfect mechanical work—and some do not—will agree with me when I say that a perfect plate requires a perfect impression. It is true that when a plate is made a certain amount of trimming is necessary, in order that it should pass between the adjacent surfaces of two teeth. But placing the plate in and getting it out, and placing the impression in and getting it out, are two very different things. In other words, a plate can be carried between two points at an angle at which the impression would not pass, consequently the more accurately the impression is, the less trimming will it be necessary to make in order that the plate should pass those points.

In relation to Dr. Dieffenderfer's method, I cannot say that it is new to me, but I do say that it is as near a perfect one as could be suggested. He does not, I presume, claim that it will meet all cases. In order to meet the requirements of individual cases it may be occasionally advisable to modify his method, but as a rule the method he has described cannot be improved upon, in view of the fact that I consider a perfect impression necessary to the perfect adaptation of a plate.

Dr. T. S. WATERS, Baltimore. I must disagree with Dr. Finley in regard to the imperfect impression. The more perfect an impression we obtain the better the result. It matters not that the piece cannot be carried to place imme-

diately after completion, for if the impression was perfect, the plate can be so trimmed as to readily meet the difficulties arising in connection with the undercut spaces caused by the irregular position of the teeth. However, in my earlier days I was taught to take these impressions in a little different way—sometimes in sections, and sometimes in one piece. It was ordinarily by taking an impression in wax, then making a cast, and that cast we would enlarge. Upon the alveolar surface and teeth thus enlarged, a gutta-percha plate was made to fit around such teeth as might be present. This method was introduced by Prof. Philip H. Austin, who was one of the finest prosthetic dentists I have ever met. His writings are concise, convincing, and edifying. The impression being larger than the cast of the mouth, the gutta-percha is serrated, and the irregular teeth of the slit gutta-percha are made to fit around the teeth, put together, and fastened with wax. After this step has been completed, the impression is taken, sometimes using a wire to make a handle. After the plaster has hardened, with a thin metal spatula the gutta-percha is separated where it had been fastened together, the plaster is loosened, and the whole removed. Sometimes the plaster will fracture and break away, but in such an event, by placing the pieces in their proper positions, a very perfect impression is obtained. After a perfect cast is secured, a plate of either vulcanite or metal is made and fitted to the mouth. It will not fit the mouth exactly, but will go to place by trimming around the teeth and properly adjusting it. It will, however, fit the alveolar surface, and a very satisfactory plate—considering the circumstances—will be the result.

Dr. C. V. MATTHEWS, Baltimore. I must agree with what the majority have said, that the more perfect the impression is, the more perfect the plate will be. If the teeth are at all irregular, so that a plaster impression cannot be obtained, and you have to twist the plate around and bend it in order to make it fit, the plate will be a failure.

Dr. H. E. KELSEY, Baltimore. I have nothing to say except a word of praise for Dr. Dieffenderfer's method. There is a distinct advantage in having an accurate cast, even if the plate has to be trimmed a little in order to get it in and out of the mouth. I agree with Dr. Dieffenderfer's theory, and I have no doubt that all the casts he makes show the same exactness as the one he has exhibited.

Dr. G. E. HARDY, Baltimore. I think the more accurate the impression is, the more apt we are to have a satisfactory plate, and we should adopt any method that will aid us in securing accurate results. A perfect impression is especially desirable when one wishes to construct a gold plate. No matter how much the remaining teeth may diverge from each other, if the ridge be accurately copied and the plate swaged to fit, the plate can be adjusted to the isolated teeth, and a very comfortable denture secured. I know of no simpler method for taking a perfect impression in such cases than the one demonstrated by Dr. Dieffenderfer.

Dr. J. T. McCLENAHAN, Washington. I want to thank the clinician for his suggestions. I have been using a method somewhat similar to Dr. Dieffenderfer's. I take an all-plaster impression, but before I do this, on the bottom of the tray about where the space between the teeth will come, I place edgewise a thin sheet of wax that will almost reach the alveolar ridge. This is removed in three or four sections, with the same result as that obtained by the clinician.

Dr. M. F. FINLEY, Washington.
"Orthodontia."

I think almost everybody in attendance today saw the clinic I gave. It was to demonstrate my adaptation of the Jackson system of regulating the teeth. I do not follow Dr. Jackson's directions exactly, but as nearly as I can adapt them to my ideas. I have shown this set of casts several times, but only once or

twice the complete set of casts of the case which I presented for the first time in Baltimore in December last, in which the two upper canines were absolutely outside of the arch, and the lateral incisors in such close contact with the first bicuspid that a silk ligature in passing between the teeth would make a decided snap. With one original appliance those teeth—the four incisors—were moved forward to allow the canines to drop into place, practically without changing the appliance. To the original appliance two spurs were added, after sufficient space had been gained to allow the spurs to pass between the laterals and bicuspid to enable the appliance to be put in and taken out of the mouth.

The appliance was put in the mouth September 28th, and on April 25th the case was completed. The canines had dropped between the bicuspid and lateral incisors. No change in the appliance was found necessary, except that of adding the little spurs in the work of carrying the teeth forward. The spurs were shortened after the canines had commenced to pass between the laterals and bicuspid, and entirely removed when it was seen that there was sufficient space for the teeth to take their normal position. The spring clasp on the bicuspid was opened in the middle, and was passed around the canine, in order to press it inward, downward, and backward. So with the one appliance from the start the case was completed.

Another case was one that I have shown before—for changing the bite. The tendency of the mandible is to drop too far backward. By making a rubber plate and anchoring it by the Jackson plan, with a ridge across the anterior portion, when the mouth is closed to a certain point the lower anterior teeth strike an inclined plane, and are thus forced to the proper position. A gold plate cemented by bands, when used as an inclined plane, breaks easily. When such a plate breaks, he who attempts to repair it must reconstruct it, and draw back the incisors before the plate will go

back to place; whereas this appliance, which is flexible, can be adapted to any condition. That spring can be shortened or lengthened, and even if a new one has to be made and that inclined plate preserved, anybody can repair it. Therefore I claim that it is simpler than any other method, as it prevents the necessity of contriving an anchoring band on the front teeth, and also on those molars in which one portion has barely erupted beyond the surface of the gum.

Discussion.

Dr. H. E. KELSEY, Baltimore. I want to ask a question of Dr. Finley. He spoke of a case in which he brought down a canine, by means of the Jackson crib, from a position high on the gum where the laterals approximated the first bicusps. I want to ask how he corrected the relation of the lower and upper teeth, which must necessarily have been incorrect; or did they correct themselves? I know it is claimed, and I believe it is true in some cases, that when the obstacle to correct occlusion is removed, the upper and lower teeth will naturally resume or acquire a correct occlusion. I want to ask if he used any appliance to bring that about?

Dr. FINLEY. The teeth assumed a natural position. I would like to say one word in regard to this set of casts. When I showed them in Baltimore a practitioner suggested that if he undertook an operation of that kind he would devitalize the pulps of the four incisors. No accident happened in these cases, and I was sure none would. The pulps of the four incisors were as healthy when the case was completed as before the teeth were moved. The case was started September 28th and practically completed in March.

Dr. C. V. MATTHEWS, Baltimore. "Administration of Kélène and Extraction."

The clinician expressed the view that kélène has over nitrous oxid the ad-

vantage that it does not exercise any depressing effect. Under its influence the pulse seems to be strong and the breathing normal; patients are anesthetized quickly, and remain under its influence at least thirty or forty seconds longer than under nitrous oxid. It does away with cylinders and the gas-bag, and is especially advantageous in the case of nervous patients, in that the excitement attendant on adjusting the gas apparatus is avoided. In comparing it with somnoform, the only difference, in the opinion of the clinician, is that somnoform will deteriorate, and that its odor after exposure is very disagreeable. He has known of several cases of slight depression induced by somnoform, but the clinician himself has had no unusual effects from either somnoform or kélène. About thirty seconds are required to thoroughly anesthetize a patient with the latter.

Discussion.

Dr. M. F. FINLEY, Washington. I can say that it is always advisable to have demonstrations with this character of preparations, provided they are safe agents. I saw Dr. Matthews demonstrate the administration of kélène, and he certainly conducted the work very nicely indeed. The patient was under the anesthetic long enough to have had several teeth extracted at any one sitting. It seems to me that if this preparation is as safe as somnoform, it has many advantages over it. It is more easily administered and it has not the disagreeable odor that somnoform possesses.

Dr. H. C. THOMPSON, Washington. I would like to ask Dr. Matthews if he can give us the physiological action of this anesthetic. We know the action of chloroform, gas, and ether—how they bring about anesthesia, but I would like to ask how kélène acts in order to produce anesthesia. In order to discuss it intelligently we must know its physiological effect. If we know what causes anesthesia in a patient, we can handle the case intelligently. Another question is

this: I did not see the demonstration, but one of my students said that one of these subjects appeared very nervous upon recovering from the anesthetic. Whether that condition had previously existed, or whether it was the effect of the anesthesia, he could not say. Was the anesthetic responsible for this nervous condition?

Dr. MATTHEWS. In answer to Dr. Thompson, I will say that so far as the pulse is concerned, it is slightly strengthened; the respiration remains about normal, and the pupil is slightly dilated. The face retains its natural color and the muscles are relaxed. In regard to the nervous patient—the person who accompanied this patient said that he suffered from some slight cardiac and pulmonary disorder. The patient was very nervous when I administered the anesthetic, and was considerably so upon regaining consciousness. I also gave kélène to another patient at that time, and in that case no nervousness was observed at all.

Dr. THOMPSON. I cannot see that the action of this drug is very different from that of somnoform. We should proceed slowly in the selection of anesthetic agents. If we know how the insensibility is brought about—for instance, if we know that a certain agent affects the circulation or respiration, the heart or the lungs, with a method of controlling those effects—we will also know how to act intelligently in the case of an accident. But if we are using kélène and do not know its effects, in what way can we intelligently guard against accidents?

The PRESIDENT. I would like to ask Dr. Matthews for the benefit of those present, how often he has administered this anesthetic, and the number of fatalities or accidents he has had?

Dr. MATTHEWS. I have never kept account of the number of times I have administered it, but I have given it dozens and dozens of times, and, in one instance, three times in succession to the same patient without any intermission, simply allowing the patient to regain consciousness and then administering it again. Kélène is pure ethyl chlorid.

Dr. ELDRIDGE BASKIN, Baltimore.
“A Method of Overcoming the Contraction of High-Fusing Porcelain.”

For the benefit of those who did not see the clinic I will describe the cavity for which the inlay was made. It extended from the labial to the lingual surface, including more of the labial than of the lingual, as it extended in an oblique direction from the labial surface across the mesial to the lingual surface near the gum. The floor of the cavity, in order to protect the pulp, was necessarily made oval in two directions, for if the filling had been made as ordinarily, a perfect fit would not have been the result, considerable space being between the filling and the cavity margin, and consequently in a short time the cement would be washed out. I began by baking the porcelain in the most remote corners of the matrix, protecting the margins as much as possible, filling the center, and bringing the porcelain flush with the margin in the last baking. After the filling was set, there was a very light line of cement.

Discussion.

Dr. SCHOOLEY, Washington. I stood close by in the early part of the operation, and listened with much interest to Dr. Baskin's theory for overcoming the contraction of the porcelain, and it appealed to me as a correct theory. The method of first placing the porcelain in the remote portions of the matrix appealed to me as an excellent method of overcoming contraction.

Dr. KELSEY, Baltimore. Dr. Baskin gave a very excellent illustration of the idea which he intended to bring out, and which, while not exactly novel, is, however, worthy of our most careful consideration. Porcelain will shrink toward its center and away from the margins of the matrix, and his method of dividing the porcelain and allowing it to shrink toward the margins is excellent.

Dr. T. S. WATERS, Baltimore. “Or-

thodontia as Applied to the Extraction of an Impacted Third Molar." [This clinic was printed in the November 1906 issue of the *Cosmos*, at page 1092.]

Discussion.

Dr. J. A. WATLING, Baltimore. Some years ago I was called upon to extract a lower third molar which lay in a horizontal position, the crown pressing against the second molar, and with but very little of the tooth exposed. As it had been causing considerable annoyance—crowding the anterior teeth out of place—the patient was very desirous of having it extracted, and as there was no space between the second and third molars, and no possibility of grasping the tooth with forceps, I resorted to this plan: Instead of removing the second molar with a sharp, spear-shaped drill, revolved by the engine, I drilled off the enamel from the crown of the third molar, in order to gain the necessary space between the second and third molars. After removing the crown, using a drill, I cut away the external plate of the alveolar process, in order to enable me to place an elevator under the molar. With just a little turn I was able to raise the tooth, and it came out very easily. The mere matter of securing sufficient space was all that was necessary. I did this with but very little damage to the surrounding parts. The process is very thick in this region, and it made a very excellent fulcrum for the elevator. The one I used was spade-shaped, round on one side and flat on the other, with sharp points. The whole operation consumed perhaps half an hour. Cutting into the enamel and into the process is not a sensitive operation at all. Quite a large part of the process can be easily removed, and as soon as the point of the elevator is under the tooth, it requires but very little force to lift it out. The direction of the force required for the removal of a third molar is upward, backward, and inward, and the tooth may be very readily rolled out, providing there be sufficient space between the two molars. I do not depend

upon the forceps for the removal of third molars, but upon a properly constructed elevator.

Dr. C. J. GRIEVES, Baltimore. This method of Dr. Waters' should be known to all who make a specialty of extracting. I have had the experience in more than one city of sending patients to the specialist of the town, who extracted good second molars in order to allow a defective third molar to come through, so that it might eventually be extracted. We all know it is poor surgery to go blundering into those cases with forceps and little experience, and the wounds that result from such surgical attempts are frequently large and deeply infected.

Dr. B. L. TAYLOR, Washington. I would like to say that generally, in cases of impacted molars, neuralgia is an accompanying symptom, and it seems to me that if this appliance be used to move the tooth back, it will intensify the neuralgic condition to such an extent that it will become almost unbearable before the tooth is extracted. In addition, if the opposing third molar be in position, the occlusion will naturally be so close that if this appliance raise it at all it will cause a certain amount of pericementitis. I would like to know if Dr. Waters has had any trouble in that respect, and if so, how he overcomes that condition until the operation of removing the tooth is performed.

Dr. WATERS. I would like to say that both of these teeth when I saw them were in an aching state—not so much from a neuralgic condition—i.e. from the pressure or impacted condition of the teeth—as from the exposure of the nerve and great sensitiveness of the cavities. I relieved the pain by the use of chloro-percha, first cleansing the cavity as thoroughly as possible. Of course there is more or less pressure brought to bear by the anchorage of the appliance on the first and second molars. To prevent the pain caused by this pressure, I applied on the gum a mixture of iodine, aconite, and chloroform, and by this means the patient was kept very comfortable. The patient for whom the lower third molar was extracted came to me with a violent

toothache, and I sent her away relieved. The following history of the case explains the reason for using the appliance: I sent the patient to an expert in the administration of gas, and he told the lady that in order to give her relief he would have to extract both the second and the third molars. This statement enervated her, and she came back to me and reported what he had said. Her condition excited my sympathy and indignation to such an extent that I proceeded to see what could be done to relieve her and to save the second molar. I took an impression and made this appliance, with the result as reported.

Dr. J. A. WATLING, Baltimore. "Dental Instrument Making."

Dr. Watling exhibited a number of instruments made by the dental students of the Georgetown University. He also exhibited a clamp for irregular and short third molars to be used where no other clamp would hold.

Dr. S. W. BOWLES, Washington. "A Method of Making and Recording Porcelain Shades."

This clinic consisted of a method for keeping a record of the shades of each color of porcelain used. A square block of porcelain is baked from the bottle as it comes from the manufacturer, after having been marked to correspond with a similar mark on the bottle in which the porcelain is kept.

Dr. L. F. DAVIS, Washington. "Use of Vulcanite Pinless Teeth in Crown and Bridge Work."

This clinic consisted of the swaging up of a box for each individual tooth. These boxes are soldered together between the bridge abutments, and afterward each tooth is cemented in a corresponding box. The advantages claimed by the clinician for this method are that

no porcelain is subjected to heat in soldering; that there is no display of gold; that the bridge is easily repaired, and that the possibility of fracture is reduced to a minimum.

Dr. H. MACNAMEE, Washington. "Porcelain Fillings."

In restoring the contour of incisors with porcelain I replace the lost dentin with the foundation body, using different combinations of colors to suit the case, and the lost enamel is substituted by enamel body. From the experience I have had, the results in blending the porcelain colors with the teeth have been almost perfect.

Dr. H. D. DAWSON, Washington. "Method of Lateral Bicuspid Attachment in Bridge Work, Preserving the Buccal Tooth-wall."

The method demonstrated for accomplishing this was by the use of a staple, cutting across the sulci of the tooth and down the mesial and distal surfaces. The tooth is covered by a half-crown, soldered on the lingual side to the staple, leaving the buccal surface exposed.

Dr. HERBERT F. GORGAS, Baltimore. "A Demonstration of the Acme Forceps for Backing Plate Teeth and Facings."

The clinician claimed that with these forceps plate teeth and facings can be backed up very accurately and easily in a short while. The union between the backing and the pins is so tight that no borax can reach the porcelain, thereby preventing the cracking or checking of the teeth.

Dr. M. C. TRACY, New York. "A New Idea in Root-Preparation for Porcelain Crowns."

The root is beveled labially and palatally, also approxiamally, leaving a horizontal floor in the center of the root.

From an impression of the root a floor of No. 30-gage platinum is swaged to accurately fit the root-end. A suitable post of iridio-platinum is inserted through the floor into the enlarged root-canal. Care should be taken that the post accurately fits the canal. This will form a seat of great strength on which to construct a crown either of all-porcelain or of porcelain and gold.

Dr. S. LESLIE LE CRON, Baltimore. "Porcelain Cusps and Bridges Attached to Gold Bands."

This clinic consisted of a method of making porcelain cusps for single teeth or in bridge work.

Dr. R. O. SADLER, Baltimore. "The Manhattan Platinoid Screw for Extraction and Building Up of Frail Teeth."

In building up frail and broken-down teeth—always using a matrix if possible—preparatory to filling or crowning, I feel more secure in the durability of my work if I have sunken deeply into the root a platinoid crown pin anchored in cement. These pins come in three sizes, and are invaluable in extracting badly decayed incisors and bicuspid.

Dr. JOSEPH HEAD, Philadelphia.

Dr. Head undertook to show that the natural color of the teeth is the same as that of the underlying stratum of the skin. He demonstrated it by pressing upon the skin until the blood was expelled, and in many patients the similarity of the color of the bloodless skin and that of the teeth was noticed. This method, he explained, would be an efficient way of deciding what the color of artificial teeth should be for edentulous patients, or of teeth that had been stained following pathologic changes in the pulp. He also inserted two porcelain fillings, one on the labial surface of an upper canine adjacent to the gum,

and the other on the anterior approximal surface of a second bicuspid.

The president then declared the meeting adjourned until 8.30 P.M.

Evening Session.

The meeting was called to order at 8.30 P.M. by Dr. H. E. Kelsey, president of the Maryland State Dental Association.

The first order of business was the reading of a paper by Dr. A. W. HARLAN, New York, N. Y., on "Restoration of Gum Tissue on the Labial Aspect of Teeth."

[This paper was printed in the September 1906 issue of the *Cosmos*, at page 927.]

Discussion.

Dr. JOSEPH HEAD, Philadelphia. Dr. Harlan has presented not only a most interesting, but also a very remarkable paper. It is the first time I have heard of any feasible plan for restoring receded gum tissue, and while theoretically novel, there are one or two little points which suggest themselves in this connection. The principal thing is that a man of his reliability says that this method succeeds. The account of the filling-in of the granulations is most interesting, and he also very interestingly answers the first objection, viz, that whenever you make an incision, a scar with consequent contraction of tissue results. There is practically always as much contraction in the course of time from the gradual coming together as there was before the tissues were cut and expanded. The essayist spreads them apart, and then they adhere to the tooth. He coaxes the gum and then makes it adhere to the root, which prevents its return.

Dr. Harlan, will you kindly tell me the formula you use for polishing?

Dr. HARLAN. Tin oxid, Spanish whitening, and glycerin.

Dr. HEAD. There was one suggestion I was going to make concerning that

mixture. Last year I carried on some experiments concerning the uses—and I may say the abuses—of certain dentifrices. For instance, I found—which is not altogether to the point—that pure pumice applied on a brush wheel the speed of which was carefully calculated could be brushed on the cusp of a bicuspid for four hours, and hardly wear it perceptibly. In that case I used the amount of friction a tooth would ordinarily get in two thousand years, and yet this same pumice or chalk that was applied to the neck of the tooth made a very deep groove in five minutes, so that I was convinced that a great deal of this so-called erosion at the neck of the teeth is abrasion. I pointed out in my paper that it was at least significant that most of the abrasion was found on the canines and incisors, and that it was hardly ever observed on the third molars, because the brush did not reach those teeth. I believe there is such a condition as true erosion, but I think in a great many instances that which we call erosion is in reality abrasion. And so while I am speaking from a theoretical standpoint, and while I am sure that Dr. Harlan's ideas are correct, I also think that a too long polishing of the neck of the tooth with chalk might be harmful.

Another point with regard to the use of adrenalin: In shaving myself one morning I gave my cheek a big gash. I applied adrenalin, and in five minutes the bleeding had stopped. I noted that instead of healing in a day or two, as usually happens in such cases, in the course of twelve hours the bleeding started again, and it took, I should say, twice or three times as long for the cut to heal as when adrenalin had not been used.

The plan of Dr. Harlan is an excellent one and I intend to try it. It is the only one I have ever heard suggested that seems to be at all feasible, and I think we are greatly to be felicitated for having had such a paper read to us.

Dr. WMS. DONNALLY, Washington. I would like to ask Dr. Harlan why he roughens the surface on which he ex-

pects the gum tissue to become attached? What is the occasion for roughening it?

Dr. HARLAN. I will answer that at once, because it is a very pertinent question. In my experience in implanting teeth—and it extends over many years—I found in those cases in which the roots were perfectly smooth, that the attachment did not take place with the same degree of vim or life as when they had been roughened. I read somewhere, a long time ago, that if bone, whether of the lower animals or of man, be scraped, and soft tissue be placed in contact with it, there appears to be a ready and almost instantaneous attachment of the soft tissues to the bone. Therefore I thought that in this operation it would be a good plan to roughen the usually polished surface, and I have ever since continued to do so. You will remember that Dr. Younger always scraped the roots of the teeth he implanted, and that Dr. Ottofy, who was my associate for years, did likewise. We implanted many from 1880 to 1894.

A MEMBER. How many now remain in place?

Dr. HARLAN. Well, I could not say, because I have not lived in Chicago for several years, and do not see those patients. However, I found that there was a certain percentage lost in twelve months, or at most in eighteen months, but occasionally there would be a tooth that would remain two, three, or five years. I know of two of them that have been in for ten years, but I have not any accurate data on that subject. I know, however, that the soft tissues became attached to the roots.

Dr. DONNALLY. My experience along that line has been entirely different with regard to the attachment of the gum tissue to the roots of the teeth. In the upper incisors we almost invariably have a groove just above the enamel margin at the neck of the tooth, and almost invariably a roughness of the surface. I recall two cases in particular that I treated some ten or twelve years ago, and another, some six or eight years ago, in which there was not only a roughness but an abrasion, and I successfully

applied treatment, first, to arrest the loss of gum tissue, and second, to restore part of that already lost. The sensitiveness of the surface was so great in one case—that of a pregnant woman, when it was necessary to relieve the pain for some time—that I used silver nitrate. Afterward, perhaps eight or ten months, I found that the teeth had been comfortable and presented a healthy appearance. The whole surface that was discolored by the silver nitrate was cut and polished until smooth, and as she was at that time in better condition to stand more treatment, I continued to polish the teeth thoroughly from time to time with a disk having pumice incorporated in rubber and linen. (I bought these disks here at the Ninth International Medical Congress.) After polishing thoroughly with the disk and otherwise, I used a stick and pumice, always keeping the gum irritated, and as the gum continued to come down, I would repeat the mechanical irritation of the under surface. I maintained this irritation for quite a while, until considerably more than half of the formerly denuded surface of the tooth was covered with gum, and while the gum adheres closely to the tooth, and foreign matter is well excluded, nevertheless one can put a thin blade under it. It has remained in a healthy condition for perhaps eight or ten years.

In the other case, there was a little roughness and minute grooves that were discolored. I polished the grooves out altogether. I had treated this case for a time and failed to get the results I hoped for; but by polishing the root just as thoroughly and carefully as I possibly could by means of pumice, orange-wood sticks, etc., and by keeping the gum irritated, the exposed surfaces of the root were eventually completely covered by gum tissue down well over the enamel. I see that case from two to ten times a year, and it has been at least nine or ten years since the gum re-covered the root. I depend more on mechanical irritation than on anything else, though I use trichloroacetic acid. By the way, I do not see just how a thread could be

kept under such places, for the reason that the gum comes down between the teeth, and the part that should be irritated is high up on the outer surface and presents a U- or V-shaped recession of the gum. I do not allow the granulation to stop altogether. I irritate from the under surface, and stimulate the neighboring gum tissue in every practicable way. In the lower teeth often a V-shaped exposure of the root highly polished is to be found. Possibly there is solution of the surface of the root, and through partial or imperfect reorganization the surface becomes abnormally hard. At all events such cases are very hard to treat and not favorable to the reattachment of the gum. In those cases I have cut from the side and drawn the gums across with a thread—an ordinary silk ligature. Very generally, though, in the lower teeth—and especially in those cases in which the recession of the gum is from a polished root—the gum is very thin and so attenuated that great difficulty is experienced in securing enough tissue to draw across the root; but, by cutting from the side, I have succeeded in getting these cases to heal across the surface. However I do not believe that there is ever a real attachment. I believe that those highly polished surfaces are unfavorable to a healthy condition of the gum, but I do not think the surface should be made rough or notched as suggested in the paper. I think the normal surface of the root is absolutely essential to a perfect condition of the gum. After granulation has started, the patient can help the operator considerably by frequently rubbing the gums with the fingers in the direction the tissues should grow. I do not believe that there is ever a dipping down of the granulations and reattachment to the root. That may be possible, and if Dr. Harlan says so I should not doubt it, though I have never seen it in my own practice.

Dr. H. C. THOMPSON, Washington. It should be borne in mind that a certain type of recession, as described by Garretson, may be due to senile atrophy. Do we ever consider the difference between

senile recession and that caused by mechanical agents or the result of loss of nourishment? If we do, then we will be able to classify them accurately. Then again, we find the type of recession mentioned by Dr. Donnally, with its resultant effects in the form of a roughness of the tissue. Now comes the question of remedying this condition, and Dr. Harlan tells us to roughen the cementum, because when recession of soft tissue takes place from bone, there is a species of atrophy in the hard tissue itself, and healthy tissue will not unite with unhealthy. Consequently when both parts are freshened, adhesion is stimulated by virtue of the presence of an underlying foundation of healthy cementum.

Dr. C. J. GRIEVES, Baltimore. Give us an idea of the nature of the tissue that grows at or between the incisions; say if it at all resembles the hypertrophied tissues that result from ligaturing, the use of regulating appliances, etc.

Dr. HARLAN. It has the appearance of being the same as the normal gum tissue, because it is of slow growth. This is not the kind of operation that can be accomplished in two or three months. I have in mind the case of a man who had recession of the gums over ten upper and six lower teeth. I began treatment in 1898, and in 1902 I dismissed him as cured. I had this patient under constant treatment for about four years, and I kept up the care of the gums by repeating the operation. For fear you might have some misconception as to the roughening of the root of the tooth, I will say that I do not roughen it down to the enamel at the first operation, but the roughening is carried on at the subsequent ones.

For fear another misconception has taken place with reference to the general bearing of my paper, I will say that in it three distinct questions are discussed, each being totally separate from the others. The first was the consideration of uniform recession of the gums; the second was in regard to the treatment of abnormally sensitive gums and teeth, in connection with which I presented a formula and the instruments, showing

how to carry out the frictional process, and the third related to the treatment of intense sensitiveness requiring the use of silver nitrate.

I do not rub those teeth for an hour or so. Neither do I perform this operation on loose teeth at all. It is on teeth the overlying gum of which has receded, and in cases in which the gum is not in a condition of senile atrophy. There are many cases of people under forty years of age showing recession of the gum on one tooth alone—perhaps an incisor above or canine below. We want to restore conditions so that the gum will cover the neck of the tooth. Dr. Donnally says that he does not believe the gum becomes reattached to the tooth. He has not performed this operation, and does not know its merits. The operation which I recommend involves a totally different principle—a surgical and not a mechanical one—the peeling of the neck of the tooth and its treatment with an irritant, such as zinc chlorid or carbolic acid.

This operation is a serious one to the patient, but after he recovers from the effects of it, and sees that the gum has come down, he says, "Why, I am ready to have you go ahead and do this again." Sometimes I do not repeat the operation for five or six weeks. Then I cut a little bit lower, and keep on cutting down until satisfactory results are obtained. I have a case of a lady now in Bronxville, N. Y., formerly of Chicago, one of whose central incisors was affected. Before I moved to New York she lived in St. Paul, and she used to come down to Chicago about once in six weeks in order that I should operate on that one tooth. It is perfectly covered by gum tissue now, and if I can see the patient before this paper is published, I will endeavor to obtain a cast of her teeth and gums, in order to show, by means of a half-tone reproduction, the necks of the teeth covered by gum tissue. What would be the use of lifting it up to see if it is attached? If there is not any pus and the gum covers the root of the tooth, then such a case is cured.

This operation is one that I have

practiced for a number of years, but I have never presented it before a dental society because I wanted to watch it until I had some positive results. The patient, whom I treated in 1898, had a gold filling in a canine. I took out that filling and inserted a porcelain inlay. The surface of the inlay was roughened, and the gum now hugs it, although it is not attached to it. As I said in my paper, I take the gold fillings out and replace them with porcelain inlays, to which, after the glaze has been removed, the gum will adhere.

In further answer to Dr. Grieves, I should not cut away any of these tissues to have them examined, because I have treated these cases for actual patients, and there are not very many people who would like to have a piece of the gum cut out for examination purposes. So I cannot say whether or not it is some spurious kind of tissue, but am sure it is not similar to what is known as fungous growth. It is an exceedingly delicate operation, and one that requires great care, and you cannot hope to succeed if you expect to dismiss your patient in three or four weeks, because you would get no result in that time.

Dr. H. J. ALLEN, Washington. I would like to ask Dr. Harlan what directions as to the post-operative care of the mouth he gives to the patients.

Dr. HARLAN. I instruct them not to brush the teeth. They can swab the mouth with a wash, but not brush the teeth. The patient experiences a sensation similar to that caused by the re-implantation of a tooth accidentally extracted. It feels very sore to the touch. I have a patient under treatment now who has been in my office four times since last October, and I am bringing the gum down over a canine. That is the only recession she has had. The gum is now about two-thirds down.

The PRESIDENT. I would like to ask how much gum tissue you have restored—that is, in an extreme case. How far in actual measurement have you brought the gum down?

Dr. HARLAN. One-sixth of the length of the root is probably the greatest dis-

tance I have succeeded in pushing the gum down, but in some cases, although the gum has been brought down close to the natural termination of the enamel, one cannot succeed in bringing it any farther; but even that is so great an improvement that the patients are perfectly satisfied. You must not promise too much. You must not say that you will cure every case. In the case of one patient, the gum lies over the termination of the enamel just like the natural gum. I have explained to the patients exactly what to do with reference to the gentle rubbing of the gums so that they will remain undisturbed. Just as soon as a woman has the neck of a tooth exposed she wants to have it covered, and she will spend any amount of money and time in bringing it about. With reference to this operation, where there is a slit in the gum—as you sometimes see it—I do not find it any more difficult to perform these operations, but I do not sew the tissues. I do not try any such experiments. I have tried before, but did not succeed.

In the case of the young man of whom I was speaking, the gum, especially that over the lower teeth, was 'way down, and he has never had any hesitation about allowing me to exhibit his case when in New York. The operation has been successful. There has not been any retrogression, but I do not say that you can do this with a loose tooth or with a root that has a carious surface, or with a very much atrophied root. In that case there is a molecular death of the surface, and you must get a fresh surface.

Dr. H. P. COBBY, Washington. There are two questions I would like to ask. Does the essayist use an anesthetic in making these incisions? and is this operation apt to be permanent, or will the same cause that produced this recession in the first place cause a recurrence of the trouble?

Dr. HARLAN. I try to do without an anesthetic if I can, but if I cannot, I use one. With reference to the recurrence, a person who has undergone that kind of an operation is not very likely to get into the same habits they had be-

fore—that is, to brush their teeth transversely and with all kinds of insoluble dentifrices. I do not think I am prepared to say whether or not there will be a recurrence, because when you have had cases that have been cured for four or five years, something unforeseen might happen that would cause the condition to recur.

I might say with reference to adrenalin, that if the hemorrhage is too profuse and does not cease in a reasonable time, one can use adrenalin. I do not care about using it myself very much, and would just as soon use hot water. I do not want anything to get into the cuts if it is possible to avoid it, and so I stuff the patient's mouth with cotton rolls to keep everything out. I thoroughly sterilize the affected area before I begin the work, and make of it a real surgical operation. I have performed this operation many times with comparatively few failures.

Dr. Donnally spoke of the silver wire used as an irritant. The reason I advocate the use of silver wire in place of the silk ligature is because pure silver wire tied around the neck of the tooth acts as a germicidal as well as a mechanical irritant. You are all familiar with the reports of the Johns Hopkins Hospital showing that pure silver would produce bacterial destruction as rapidly as almost any of our germicidal agents. You have to keep up an irritation around the necks of these teeth for a certain period, until these places are filled in with scar tissue, and the germicidal effect of the wire is very beneficial. You may leave the wire on two, three, or four weeks if necessary.

Dr. DONNALLY. Is it thought that the germicidal action of the silver wire would continue for that length of time?

Dr. HARLAN. A pure silver wire will be almost completely dissolved in the mouth in three weeks, sometimes in less time than that.

Dr. DONNALLY. I have been told it would not last over two days according to laboratory experiments.

Dr. HARLAN. Mine are actual cases. I tried it on the real person, and I con-

sider that if a sufficient number of men will become thoroughly interested in this operation, and perform it in the way that I intend it should be, they will succeed in having the gum cover the denuded roots of canines and incisors that otherwise they would never have attempted to treat at all. It is not intended that this operation should be performed on loose teeth; it is only meant for teeth that are firmly implanted in the jaws.

Dr. M. F. FINLEY, Washington. The ideas contained in Dr. Harlan's paper will revolutionize the practice of dental surgery. I do not know just how long ago operations were attempted for remedying this condition by means of ligatures and sponge grafting. Particles of flesh, as well as sponge, were planted in those spaces and ligated there to overcome the recession. Of course they were failures, and it certainly is pleasing to have a method given to us which eliminates the possibility of sloughing or the ligature slipping, as was the case in the attempts to graft entirely separate particles into these spaces. Not even does the essayist in these cases of fissure roughen the exposed edges of the tissue. He leaves that entirely alone. He cuts his slits higher up in the gum, makes new tissue there, and pushes all the tissue from there down, thus covering the exposed root.

Dr. JOSEPH WASSALL, Chicago, Ill. I am very sorry that I did not hear the paper, though I am somewhat familiar with the work the essayist has been doing in this direction. Of course to have the gum brought back to its normal position after it has been lost by disease or by recession is a very desirable thing, and we are constantly called upon by patients to give them some help when they see this condition going on in their mouths. It alarms a woman considerably to notice that the cervixes have become exposed, and even before that condition is noted we are constantly appealed to to relieve the surface sensitiveness. I am inclined to think that there is not very much we can do to relieve such conditions. There is so much gum

recession that is natural and normal—a part of the process of growing old. In the first place, nature intended that the gums should recede, that the teeth should wear down. Man in his natural state, living as a savage and using his teeth to masticate coarse foods—as he must do when wild—wears his teeth down. There are cases at the ages of thirty-five or forty where the teeth are worn almost to the gum. This recession that people complain of is only the normal process. Therefore when people complain to us and ask what we can do, we must quiet their fears, and tell them that they have passed the age of sweet sixteen.

This recession, however, does not imperil the usefulness of the teeth, even though one-third of the socket has receded. There are many cases where this condition has been engendered by the wrong use of the brush and insoluble dentifrices and by disease conditions. There are conditions which produce pockets and loss of gum tissue. Some of the measures which the essayist suggests might be useful. I remember very well Dr. Atkinson's sponge-grafting operation for this condition, and recall trying it myself and not succeeding. I presume that was referred to in Dr. Harlan's paper tonight. I cannot think of any cases where this would be useful except in the actually morbid cases and actual pathological recession of the gums—and you must differentiate between the pathological and the physiological recession. In the physiological I could not give my approval of the operation suggested by the essayist.

Dr. HARLAN (closing the discussion). With reference to Dr. Wassall's remarks, as he did not hear the paper, they of course were foreign to the subject. I said where there is a uniform recession of the gums I do not do anything at all. I understand that horses, cows, and wild animals, etc., wear their teeth and gums down more or less uniformly. But we have a great many cases of recession of the gums around canines and centrals above and below, where an operation of this kind is not only feasible, but is just as useful to the patient as any other

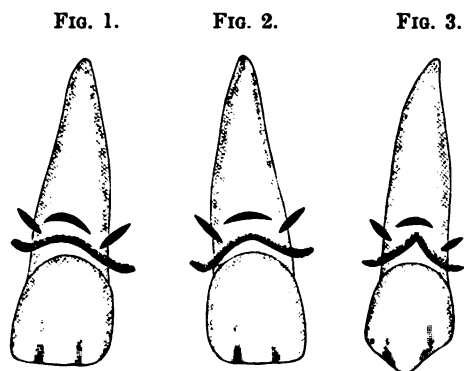
operation we are in the habit of performing. It is not expected that every dentist will engage in this practice, because they have not the clients who will pay for it or give the necessary attention to it, just as people will not have all their teeth filled with porcelain or gold inlays, because they do not understand the value of these operations. If they understood that it would improve their appearance very much, they would have gold fillings replaced with porcelain inlays. Porcelain is better than gold in suitable localities. Gold is very much better than porcelain in the crown of a posterior tooth, because you have to masticate on it.

An operation of this kind is something new to the dental profession up to this time. The attempts at sponge-grafting were doomed to be failures in the beginning because the conditions were so different from what they are in other portions of the body, and the operation for stitching the gums together to close a slit on a lateral incisor or a canine were foredoomed because there was no way of keeping those freshened edges set, and the tissues did not unite. This proposition is to make the best possible condition for pushing down and constructing the gum around the root of the tooth, and the object, as Dr. Thompson very beautifully expressed it, of roughening this denuded, polished, and dead surface was to get a fresh surface, so that when you did push it down it might have an opportunity to become reattached. I have not tried this operation on pulpless teeth, nor have I tried it on loose teeth, as it is not an operation that is proposed for filling in the pyorrheal pockets; it is for recession of the gums on the labial aspects of the teeth, and that is the purpose for which it is presented.

The gum is lifted from the labial face of the root and a portion of the interproximal space to the desired depth, after which the three incisions are made through the gum to the root. These are filled with dried zinc iodid, to distend the incisions and keep them open so that the healing may begin from the bottom

toward the surface of the gums. New tissue—cicatrical—will fill the cuts and push the gum over the exposed neck of the tooth. (See DENTAL COSMOS for September 1906, page 927.)

Figs. 1 and 2 show the operation on incisors and Fig. 3 on a canine. They are self-explanatory.



I have nothing further to say except to thank you for your patient attention.

The PRESIDENT. I think we are very much indebted to Dr. Harlan for this direct, novel, and altogether interesting paper. It is a perfect revelation to me, and I am quite sure it is to the others present.

Dr. DONNALLY. I do not think there is anyone here tonight who appreciates the paper more than I do. I think we owe a great deal to Dr. Harlan and the union associations for having him here, and I move a rising vote of thanks to him for coming to our meeting and presenting this very valuable and interesting paper.

Dr. Donnally's motion was carried, and the societies extended a rising vote of thanks to Dr. Harlan.

There being no further business at this time the meeting adjourned until Friday morning.

FRIDAY—Morning Session.

The meeting was called to order at 10 o'clock by the president of the Maryland State Dental Association, Dr. Kelsey.

The first order of business was the reading of a paper by Dr. F. F. DREW, Baltimore, on "Dental Education," as follows:

DENTAL EDUCATION.

Dental education in this enlightened age is a subject which should receive much attention, and to treat so important a matter exhaustively in a report would tax your time and patience too much. It will be my aim, therefore, to present my views in as condensed a form as possible, and to treat the subject in a broad and liberal manner and along ethical lines, recognizing the fact that dental surgery is a branch of the healing art—a dignified profession and not a mere mechanical calling.

Briefly stated the sources of dental education should be primarily—"A high-school education," followed by "graduation from a reputable dental school," "indorsement by a state dental board," and last but not least, "membership in a state society." I propose to take these sources up separately, and to endeavor to show the importance of each in building an up-to-date, intelligent dentist, one who will command the confidence and respect of his professional brethren and the public.

A high-school education. The day has passed when the mere mechanical training of the hand will be regarded as the *ne plus ultra* of the dental surgeon. That qualification *per se* is highly desirable, but in order to produce the best results socially and professionally the technical should be preceded and accompanied by a thorough mental training. The man who has just left the workshop of the mechanic, or the day laborer who can hardly write his own name correctly and has had no intellectual training, is hardly in a condition to investigate the mysteries of anatomy or *materia medica*.

No man is worthy of the degree of any college whose ethics is the virtue of his ignorance, who cannot write a line without misspelling the commonest words, and whose conversation puts one's nerves on edge. A degree given to such a man

is simply a declaration of the unworthiness and mercenary character of the faculty by whom it is given, and places another obstacle in the way of professional advancement.

Nowadays the one great desideratum of young men entering our institutions of learning is the saving of time in arriving at practical results. What is to be done must be done quickly, and no time is given to the acquisition of the great principles which underlie a broad professional training, and which should constitute the foundation upon which it is built. In the haste to be rich, each seeks to join the busy throng of workers, and there is no time for aught which does not produce immediate results, and the superficial character of his knowledge is the consequence.

It is therefore highly desirable that all candidates for the degree of D.D.S. should be well grounded in the principles of a good fundamental education, which can alone furnish the mental drill necessary to develop their intellectual faculties. In other words, they should be taught *how to study* and to mentally assimilate the problems presented in acquiring a learned profession.

The public is always ready to recognize the cultured gentleman, and to accord him that respect which his general bearing and conversation commands. It resolves itself into the personal equation, and if dentists complain of lack of social recognition they alone are to be blamed for it. It simply proves that they have not taken advantage of their opportunities, but have been contented to drag along in a desultory unambitious way, with no high ideals and no desires beyond a routine existence. Let us insist, therefore, that our students shall have a high standard of education before being accepted by our dental schools, and thus we shall insure a better product.

Graduation from a reputable dental school. It scarcely seems possible that any fair-minded person would contend that a student could be properly educated in dental surgery without graduation

from a regularly chartered school; but the practice of some states, whose dental boards admit to examination for license candidates who do not hold degrees, would seem to indicate that in a few states, at least, the idea still prevails. Such a practice is highly objectionable and pernicious, and the sooner such states amend their laws to require a diploma as a prerequisite to examination, the better it will be for the profession and for the public.

The assumption by anyone of the title of Doctor of Dental Surgery without authority should be prohibited by law. No student can obtain the necessary qualifications to practice from a preceptor who can only give him the technique, and even granting that he could absorb sufficient theory to satisfactorily pass a state board examination, he should not be allowed to assume the title of "doctor," as that is a right vested in chartered institutions, which alone have the authority to confer it.

Germany has ruled that no native of that country shall be deprived of the privilege of making a living in the way he deems proper, but it prescribes that he who practices dentistry shall inform the public of just what his qualifications are. If a doctor of dental surgery, he has the authority to assume the title of "zahnarzt," but if simply a mechanical dentist he must call himself a "techniker." In the case of a foreigner he must be recognized—even if he hold the degree of D.D.S.—by the government before he is permitted to assume the title.

This is a much safer plan than prevails in this country, where a man may assume any title he pleases, and the public accepts it without question.

Dental schools in this country are universally admitted to be the best in the world. In point of equipment they excel all others, and are generally progressive and faithful in discharging their obligations to the student, who is afforded every opportunity to acquire a proper dental training. They are doing a great and noble work and deserve spe-

cial praise for their labors. They have done more to raise the status of dental surgery than any other educational source, but I desire to make a criticism, and that is, that while the technical side of their teaching has been emphasized or featured, there has been a lack of instruction along the medical lines so necessary to broaden the student's mind and to eliminate the mechanical idea so prevalent in connection with our specialty.

Graduation in medicine, from my standpoint, is not absolutely necessary in the education of the dental surgeon, but he should read the medical subjects which will better equip him for diagnosing pathological conditions.

Dental schools should also deliver a course of lectures on "ethics." If this were done it might change the commercial idea so prevalent at the present time. Students should be taught that when they resort to unethical practices they bring disgrace not only upon themselves but upon the whole profession. The dental schools can do much toward eliminating this pernicious practice, and should devote all their energies toward accomplishing that result, and thereby obtain the gratitude of all legitimate practitioners.

Indorsement by a state dental board. Evidence is not lacking to prove that state dental statutes when properly administered are an important source of dental education. No state in the Union is without one at the present time, and our foreign possessions also have enacted them.

Primarily the object of all dental laws is the protection of the public against incompetence, but incidentally they serve to stimulate the colleges to so train their students that they may pass the state examination, realizing that failure is a reflection upon the school. Students also are induced thereby to apply themselves more closely to their studies, because they know that a diploma alone does not endow the holder with authority to practice legally, that right being vested solely in the state board, whose certificate is necessary.

From an extended experience as an examiner I have been fully impressed with the importance of our part in the education of the dental graduate. The final test of a graduate's ability should always be made by a disinterested body to whom the student is unknown, and who judge him solely by his ability. A great point, therefore, in favor of the state board is the elimination of favoritism. College faculties are connected with their students more or less for a period of three years, and in that time are apt to form attachments which may influence them in their final judgment.

This state of affairs could not prevail with the examining board, and its importance as an educational factor is thereby enhanced. Great care should be exercised by the profession in selecting men to serve as members of examining boards. They should be composed of broad-minded ethical men whose dental attainments are unquestionable and whose moral standing in the community is recognized. Politics should never enter into their selection, and examiners should realize that theirs is a sacred trust, which should be above taint of all kinds, and that they should perform their duties fearlessly and impartially, with due regard for the rights of all concerned.

When men who have the proper qualifications are found they should be retained as members of examining boards. It is a position requiring tact and experience, and when once recognized the man possessing it should not be cast aside. The official acts of examining boards should at all reasonable times be open to public inspection, and every precaution taken to secure an impartial administration of its affairs. With a board so constituted and its principles so applied, the interests of the dental graduate and the public will always be safeguarded.

Membership in a state society. A post-graduate course is greatly to be desired by all broad-minded members of the profession, and this is furnished by the state society. Graduates should be taught that they do not know it all

when they obtain their diplomas and state board certificates—that is simply the beginning, and they should be encouraged to connect themselves with the state association and to take an active part in its proceedings. There is nothing so stimulating to a young man as the friction produced in the state associations. It will do more to disabuse him of the idea that he is the “only pebble on the beach” than anything else, and will place him in a position to keep in touch with the best element of the profession, and to see and hear things which he can get in no other way. Dentists should realize that there is no such thing as standing still; that they must either go forward or backward, and that mental apathy is fatal to enthusiasm and ambition. Dental societies should be broad and liberal in their views; they should be ready at all times to extend the helping hand to their erring brothers who have seen the error of their ways, and who desire to reform and become ethical. Such men should be encouraged to join dental societies rather than discouraged—their past should be forgotten and the trend of their minds be changed. Many such men have been reclaimed and made useful members of the profession by the elevating influence of the state society, and can be managed better when members than when not. The old proverb has it—“Choose that course of life which is the most excellent, and habit will render it the most delightful.”

All members of the state associations should be active members; they should be ready and willing at all times to do all in their power for the elevation of their profession, and not be merely “sponges,” absorbing all they can and giving nothing in return except when “squeezed.” They should be ever ready to give as they have freely received. Let each one do his part promptly, even when it seems unimportant—someone may learn by his experience—and not wait until he discovers something original or startling.

Do not then stand idly waiting
For some greater work to do;
Fortune is a lazy goddess,
She will never come to you.

[VOL. XLIX.—44]

Go and work in any vineyard,
Do not fear to do or dare;
If you want a field of labor
You can find it anywhere.

In conclusion, we must acknowledge the necessity that lies upon us to labor with earnest and united effort to keep our profession in its exalted position. The past is irretrievable, but the future is in our hands, and it is our own fault if we do not make such use of it that we all may live to find that we are members of one of the noblest of learned professions.

Discussion.

Dr. W. A. MILLS, Baltimore. I wish to say that I heartily agree with everything the essayist has said. It seems to me that his arguments are steps in advance—steps in the direction of that which is to come.

He brought out the point that in his opinion dentists should not take up the study of medicine with the view of obtaining the degree of Doctor of Medicine. And neither do I, but I assert that we should know something about medicine as taught in the medical schools. We can gain all the information we need by simply reading medical books and journals such as the *Journal of the American Medical Association*. We are eligible to membership in the American Medical Association, notwithstanding the assertion made by some that we are not in good standing with the medical profession. No dentist can consider himself in good standing in his profession unless he be a member of his state dental association, and if he be, he is eligible to become a member of the American Medical Association, the national medical organization of this country. Much that the essayist has said is in the right direction—is food for thought. The time has now come when the dental practitioner must be a broadly educated man. Take such an one—there are some—and see how superior he is to some of us who are otherwise. Why should we like laggards stand back? Onward! should be our watch-

word. It is a duty we owe to our profession, ourselves, and our patients.

Dr. JOSEPH HEAD, Philadelphia. Not being connected with any college, naturally I regard this subject purely from the ranks of the profession, and being devoted to the practice of dentistry I am extremely jealous of its reputation. Dental education must of course be something to which we all have to look, unless we are going to be swamped by a great deal of ignorance. The point raised concerning the study of medicine was extremely well put. When I first graduated in dentistry, it was not as well taught as at the present time. There was more, as was stated today, of a tendency to make us merely mechanics, and so shortly after I graduated I studied medicine. In doing this I had the great advantage that I studied it from the point of view of dentistry, and that is what I think practical dental colleges are now teaching. From my experience with the graduates of the last ten or twelve years, I do not believe that it is necessary for any dental student now to take a course in medicine. I think that the dental colleges are very wise to give all of the general medicine required. General medicine is divided into a series of specialties. I believe it was President Elliott of Harvard College who explained that any man, to be thoroughly posted in medicine, ought to study twenty-five years before he could hope to be on a par universally with all of the specialists, and when you come to think of that, during the last five years he would be twenty years behind in some of his studies. So I think when we consider the question of studying all of general medicine we shall have to give it up as hopeless.

Our essayist speaks of the great charity which we owe to the charlatan who has reformed. I would be the last one to withhold charity from a fellow practitioner, but I cannot help feeling that if we generally accept a quack who has built up his practice on quackery, and let him come into the dental societies on an equality with the younger dentist who has started ethically, we are en-

couraging quackery. While I do not mean to say there may not be special cases—there may be a man who perhaps might have been insane temporarily, or have had a long-suffering mother to care for, and he might be commiserated for his false step—I think, however, we should very carefully examine that man's record, and if he left the college and simply used advertising methods for the purpose of getting a start, I for one should be very loath to give him the hand of fellowship.

Dr. F. GROSHANS, Baltimore. I think the dental profession has stood more nagging from the medical profession than any other profession was ever asked to stand. We are always asked to swallow the whole medical profession, boots and all, and we as dentists, I think, should be a little polite—we should check this by politely asking the medical profession to take a dental course. They do not know anything about dentistry, and do not want to know, but they expect the dental profession to take in everything. I think we ought to ask them to take a course in dentistry to complete their medical education.

Dr. E. A. BOGUE, New York. I have not much to say on this subject, but your essayist has brought up some points that are certainly worth considering. In view of the fact that his paper is perhaps more academic and instructive than anything else, I may venture a word or two. It seems to me that we as a profession are in a developing condition. Dr. Drew alluded to the state laws as being protective against the ignorant. I could not help thinking of both the German and French laws in this connection. The French laws are eminently to be preferred to protect the individual French dentist, for the instruction given there is by no means equal to ours. Yet our men must pass their examinations. Their question is, "Why should we allow a foreigner to practice in France without his spending the same time to prepare himself that our citizens have spent." An American who is a graduate in medicine and dentistry must still go

through the same curriculum as the French student, if he wishes to practice dentistry in France.

In Germany it is a little different. But there again, for our consideration, attention may be called to the fact that a man may be a professor, a doctor, or an instructor in operative dentistry in Germany who is not able to hold a candle to some of our dentists, while it is true that his medical ability and instruction may surpass that of many of us. We are fortunately placed in that we have dental laws in most of the states—as Dr. Drew has correctly stated—to supervise and check possible abuses in the case of a college graduate. It is eminently desirable, and we are very fortunate in it.

Now comes the question of proper education, upon which the essayist placed some stress at the beginning of his paper. Harvard University, as you all know, has taken a stand somewhat in opposition to the general view of three or four years ago, holding to their three years' course as against those who wished to have four years—for one reason, because their course was longer than most of the other colleges, but principally because the entrance examination was much more severe. It was only the day before yesterday, in Boston, that I was told that unless Harvard students increased in number the Harvard Dental School would go down. "Their examinations," one said, "are too severe, keeping out the greater number of students who would otherwise matriculate." You can see from that how correct Dr. Drew is in the position he has taken.

In regard to the recognition of those without diplomas, there occurred an incident—also in Boston—the other day that pleased me very much. A gentleman there, Dr. Freeman, is not a graduate. He was prevented, I think by the very circumstance mentioned by Dr. Head, from graduating when he was a younger man. He has managed to get into practice, and he has lately devised an apparatus to replace the lost part in the amputation of the lower jaw, which for efficiency and accuracy surpasses anything I have ever seen.

I do not think that the medical profession have troubled themselves to nag us very much. It does not seem to affect us one way or the other; but if we will take the pains, it does not require much hard work to get a medical diploma if we want it. Once more I pay my respects to Dr. Drew, for he encourages the young fellows to do the best they can.

Dr. C. J. GRIEVES, Baltimore. This is a broad subject, and there is just one point that always appealed to me, and that is this: the great danger in preliminary education for one entering a profession demanding technique is that of over-education, to the neglect of finger-craft. A course in technology, with some training in letters, should be second to one in the preliminary requirements.

There have been few cases coming to my knowledge of successful dentists who took their degree of D.D.S. after a long training in medicine; there are many of whom the reverse is true.

Dr. DREW (closing the discussion). In regard to Dr. Head's criticism concerning the acceptance of quacks and charlatans, these terms are probably a little too harsh. I had in mind the young men who start out with the intention of building up a practice upon ethical lines, but who being handicapped financially, sometimes resort to such unethical means as the insertion of advertisements in the papers, hoping in that way to gain a start. There is a degree in crime. My reason for making that suggestion was to plead that such men be given a trial—a chance. In all cases where they are proposed for membership their names are first submitted to the members of the association, and the degree of their offence is investigated. If found to be a very slight one, I think the violation should be overlooked, and they be given a chance to do better. I have known a great many instances where these men have become ethical in every sense of the word. Of course, where a man is known to be a quack, I am just as opposed to accepting him as Dr. Head would be. I make a plea for the young men whose minds have been

misdirected. They ought to be helped. The preliminary part of the examination—or rather the entrance examination—is one that is very important. I believe that all men should have a certain amount of preliminary education before being accepted by the colleges, and in this connection I know of nothing better than a high-school diploma.

The next item on the program was the reading of the report of the Committee on Pathology and Materia Medica, by Dr. H. C. THOMPSON, Washington.

The President then called for the reading of a paper by Dr. HOWARD HOFFMEISTER, Baltimore, on "Pharmaceutical Revision," after which this paper and Dr. Thompson's paper were discussed conjointly.

[Dr. Hoffmeister's paper is printed in full at page 573 of the present issue of the *Cosmos*.]

Discussion.

Dr. M. F. FINLEY, Washington. Dr. Hoffmeister's is a technical paper of much interest, and deals with a subject to which we should give more attention than we have in the past. There is one suggestion in the paper that can be acted upon later. I think as a body the National Dental Association should consider the question of sending to the Pharmaceutical Convention delegates to look out for the dental list of drugs that are used almost exclusively in our work, and I shall make a recommendation to that effect at the next meeting of the National Dental Association.

The PRESIDENT. I think this paper contains a thought on which it is well for us to express an opinion—the idea as to whether we are taking a sufficient interest in the Pharmacopeia as applied to our specialty, and I should be very glad to hear the opinions of the members present on the subject.

Dr. W. A. MILLS, Baltimore. I do not feel able to discuss the paper—it is too technical; but I wish to make one point with regard to prescribing remedies: I think, if we consider ourselves as members of a learned profession, that we

should never use the printed, ready-made prescriptions sent out by the proprietary men. Many such remedies are excellent, but we should write out the names of the drugs ourselves. It is more pleasing to the patient and more elevating to our reputations; and when we prescribe any remedy formulated by ourselves, we should do it as Dr. Hoffmeister says—in a proper manner, using the proper name as set forth in the U. S. Pharmacopeia.

Dr. HOFFMEISTER (closing the discussion). Probably I have not laid sufficient stress on the need of becoming conversant with, and the employment of, official articles. Our lack of knowledge in matters pertaining to materia medica, and our blind dependence in such matters on men who we take for granted know more than we do, has always impressed me forcibly and unfavorably ever since I have been connected with dentistry and associated with dentists. It is evident, and needs no substantiation, that we should have some standard means of regulating the identification, strength, and purity of drugs. Having such, why should we not employ drugs and preparations which have thus been standardized? If my paper has stimulated even slightly that dormant interest, it has not been written in vain, and I hope that the suggestion offered by Dr. Finley will be very eagerly acted upon.

Dr. DONNALLY. I would like to offer a suggestion in the form of a motion with regard to this paper. I move that the paper be referred to the proper section of the National Dental Association, and that special stress be laid on the suggestion it contains as to the representation the dental profession should have in the make-up of the next Pharmacopeia.

The motion was carried.

The next order of business was the reading of a paper by Dr. C. L. CONSTANTINI, Washington, D. C. on "Antiseptics and Disinfectants."

[This paper is printed in full at page 579 of the present issue of the *Cosmos*.]

The PRESIDENT. We have with us another gentleman who has a paper from

the same section, and if you desire, as the time is approaching for the close of this session, we can have this paper by Dr. Bain read now, and the two papers discussed at a later session.

Dr. THOMPSON. I move that the paper be read now, and the discussion held at the evening session.

The motion was carried.

Dr. SENECA B. BAIN then read his paper on "Physical Methods in the Practice of Dentistry."

[This paper was printed in full at page 1193 of the December 1906 issue of the COSMOS.]

The PRESIDENT. We have another gentleman with a paper, which we find it impossible to present unless he does it now, as he is obliged to leave the city. Is it your pleasure that we have the discussion of the two papers just presented, or give this gentleman an opportunity to read his paper?

Dr. Thompson moved that the discussion of the papers of Drs. Constantini and Bain be deferred until the evening session, and that Dr. Groshans present his paper.

The motion was carried.

Dr. F. GROSHANS, Baltimore, then read a paper entitled "Ethyl Bromid as a General Anesthetic."

Motion was then made and carried to adjourn.

Evening Session.

The meeting was called to order at 8 o'clock P.M. by the president of the Maryland State Dental Association, Dr. Kelsey.

The President introduced Dr. F. W. STIFF of Richmond, Va., who addressed the meeting in behalf of the Jamestown Dental Convention, to be held at the time of the Jamestown Exposition.

Dr. Stiff outlined the scope of the convention, and asked the moral and financial support of the Maryland and District of Columbia Societies.

The meeting then adjourned until the Saturday morning session.

SATURDAY—Morning Session.

The meeting was called to order at 10 A.M. by Dr. Rust, president of the District of Columbia Dental Society.

The first item of the program announced by the President was the reading of a paper by Dr. JOSEPH HEAD, Philadelphia, Pa., on "The Human Skull Used as a Gnathodynamometer to Determine the Value of Trituration in the Mastication of Food."

[This paper was printed in full at page 1189 of the November 1906 issue of the COSMOS.]

Discussion.

Dr. J. W. WASSALL, Chicago, Ill. I think the profession is under great obligations to Dr. Head for the work he is doing along this particular line of investigation and experimentation. I think we are to be congratulated. These experiments and the results that are obtained add to the sum total of our knowledge, and there are very few men who are disposed or properly equipped or have the taste to carry them on. I hope that Dr. Head will persevere in this work. The benefits that accrue to us from such knowledge are inestimable. I think when Dr. Black's paper was published on this subject it was a revelation to us all, and we could understand for the first time why a tooth would break under pressure. We could understand that it was not such a marvelous thing to pick up a chair and hold it in the teeth, or to see a woman swing high in the air, holding herself by her teeth. It would be interesting to know just the degree of muscular power that is exerted by different individuals. I have no doubt that some people have much stronger muscles and use their teeth much more than others. The strong-muscled person must exert much more power than the more delicately formed one. I wish Dr. Head would employ his ingenuity in this line in order to test actually in the mouth by means of some recording instrument the force exerted in biting.

Dr. HEAD. Dr. Black has made a long series of experiments with a dynamometer to determine the pressure exerted by the jaws in the act of biting, and has shown that at four years of age a child may exert a pressure of sixty pounds, and that with advancing age this may be increased to three hundred pounds.

Dr. H. E. KELSEY, Baltimore. As has been said, Dr. Black did some splendid work along this line, and a work which no doubt stimulated others to undertake investigations on similar lines; but I fully agree with Dr. Head that the conditions under which Dr. Black experimented were not nearly so natural as those which Dr. Head employed, using, as he did, a natural skull and teeth. I understand that Dr. Head's idea in showing this skull prepared to imitate the natural motions of the mouth is to illustrate that there has been a wrong conception as to the amount of pressure necessary to properly chew food, and that all substitutes for the natural organs can do good work with less stress than has been supposed to be necessary. I am very glad that he has given us such a clear demonstration of this fact. I have trembled many times over substitutes which I have placed in the mouth. Sometimes they have failed; other times they have not, when I feared they would, because my estimate of the stress that would be placed upon them was too high. I do not think too much can be said upon the point Dr. Head has brought out, that it is not alone the absolute force and direct stress which is exerted, but the trituration of the food by the lateral movement of the jaws that is so effective in mastication. If it is not that, why have we this beautifully arranged dentition, with the cusps fitting into the sulci to tear the food into particles? Perfectly flat surfaces, we are well aware, would not do the work, and a very much slighter lateral pressure, together with the closing pressure, will operate, as Dr. Head has demonstrated, very much more effectively than the straight pressure. I am unable to go into figures, therefore I cannot discuss

the technical side of this subject as I would like. This paper I think is original matter, and we can only discuss it from the side-lights of our present information on the subject, which is meager. I am very sure that we are to be congratulated on the result of Dr. Head's novel experiments presented to us at this meeting.

Dr. H. C. THOMPSON, Washington. Dr. Head's investigations open up a field that had already been partly opened by Dr. Black. Take an ordinary piece of beef; you may cut it all you want, but if it be tough, it will remain so, even if it be cut into small particles. Put it in a tritulating machine, and with one-half the force required to cut it into small pieces you can reduce it to a tender, easily digestible mass. That is the relation the puncture bears to trituration, and we want to realize the necessity for trituration as well as puncturing. Then we will be able to have the food in such a form as nature intended it to be; not in segments, but in a comminuted mass, thus allowing for the intermixture of the digestive fluids and the food.

This paper is one, I think, that will lead us to revolution, particularly in prosthetic work. It will teach us the greater necessity for preserving the function of mastication through operative procedures. The functions of the teeth demand that wherever a surface is lost it should be restored; consequently this paper that Dr. Head has presented to us brings out and emphasizes the necessity of preserving the surfaces in order to get the full functional activity of the teeth in mastication.

Dr. M. F. FINLEY, Washington. I am delighted to have heard a paper by such a worthy exemplar of our faith. I think it brings to our minds the causes of certain disturbances of the natural teeth, and also certain difficulties we meet with in fitting substitutes, in that the amount of pressure required to make the teeth pass through the different food products indicates the blow that the teeth receive when the teeth puncture the food and strike each other. The steady pres-

sure required to masticate food is not the danger point. It is the arrest of that pressure, and the speed that was applied when that pressure was put on. Almost invariably the breakage in a natural tooth or in an artificial tooth is claimed to be the result of finding something in the food that the patient did not expect, such as a piece of oyster-shell, or a bone in meat. The jaws are started toward one another with the necessary pressure to go through that food, and then meet with a sudden obstruction, causing the damage so often reported by the patient. The long experience of each individual in eating three times a day so accustoms the nerve centers to the amount of pressure required, that the instant a certain character of food is put in the mouth the muscles start with a speed and with a pressure to make the teeth pass through it, and, as I say, it is not the actual steady and slow pressure that causes damage, but the stoppage of that blow. Patients will tell you they found a piece of oyster-shell or something of that kind in the food; the speed was suddenly stopped, and the strain caused the trouble. In all railroad accidents it is not the speed with which the train is going that causes the trouble, but it is the sudden stoppage. If you could have a series of springs to slow up the speed, it would be all right.

Dr. C. M. FORD, New York. I have very much changed or modified the views I formerly held on this subject. Dr. Black's figures seem entirely too high. The necessity for recognizing the construction of all occlusal surfaces I consider the practical side of the paper. The simple up-and-down shutting of the mouth does not cover the normal functional purpose. I think it would be interesting if Dr. Head would carry on a series of comparative experiments to show the immense amount of force which certain animals use in chewing. The whole subject is a proper field for investigation, but unless we have indulged in those experimental studies we are not in a position to discuss its practical side.

Dr. H. P. COBBY, Washington. It is in this connection of great importance

to emphasize the necessity of allowing children to learn—I do not say to teach them—but allow them to learn in a natural way how to properly use the muscles that are brought into play in the mastication of food. The child's teeth should be kept in a proper condition, so that he may acquire the habit of properly masticating his food. It is as natural for him to learn how to masticate as it is to learn to walk or to do anything else, and the more perfectly the teeth of a child are preserved the more perfectly will they perform the function of mastication, and the more continuously throughout life.

Dr. HEAD (closing the discussion). The subject of mastication of food is one that has been stirring our minds ever since 1895, when Dr. Black brought forward his very astonishing figures in this line. The measurements that Dr. Black made throughout the whole article are so complete as to challenge criticism. The force capable of being exerted by artificial teeth, as I remember it roughly, was for upper and lower sets twenty pounds. In some few instances it might have approached thirty. There was one extraordinary instance of a man with artificial upper and natural lower teeth who could exert as much as forty pounds pressure; but we all know from our own experience that there are a great many people who cannot put forty pounds of pressure on the upper artificial teeth. If it were a question of exerting forty pounds of pressure on such teeth or drowning, most of such patients would drown.

Are we to accept the conclusion which Dr. Black drew—that artificial teeth are practically useless as regards the mastication of food? He makes that statement with the utmost frankness. He considers it rather painful to think that our artificial teeth are so imperfect. We all know perfectly well that when we get certain tough bits of food we cannot chew them. It is no news to us to know that there are some things we cannot chew, but the question is, what can we do with the ordinary food put before us on our table? and it was that very thing which led me to carry out these experiments.

Dr. Black's machine was made to act in purely an up-and-down motion, without triturating force. The force is exerted on two molars, side by side, together with the occluding teeth, but he said that from his own experiments in chewing meat he did not give a triturating motion. When I chew meat I feel there is trituration, which tends to divide the particles of the meat into two distinct parts. When a series of cusps come down loosely between other cusps there is no trituration; only a series of punctures are made in the meat. Unless there is a side tearing motion there would not be real separation of the meat—only punctures in a long line.

The great point, however, is the one made by Dr. Thompson, that since these cusps are so important and trituration is so important, it is most essential that we should preserve the cusps and their perfect articulation in artificial work. Too frequently teeth are made to absolutely occlude with ground surfaces! That may be called a perfect occlusion as regards the surfaces, but not as regards the chewing of the food. We know that if we take a pestle that would absolutely fill up the entire mortar, we could rub for years before we could pulverize the mass, but by taking a small pestle in a mortar, by slight rubbing the entire mass is soon triturated, and that I believe is the principle upon which the teeth act. So that in between each cusp there is an actual pestle-and-mortar movement, which is valuable, as Dr. Black pointed out, for the mastication of cereals, and in my opinion is quite as valuable in the mastication of meat. I can hardly believe that when we are chewing we chew straight up and down in one instance, say for meat, and suddenly triturate for cereals. What are you going to do with a mixture of meat and cereals together? Of course that may seem absurd, but to me it seems somewhat germane and to the point.

This is a subject where the personal error of the experimenter may vitiate all the experiments, and I hope there may be many here who will take the appliances I have used, and try these ex-

periments for themselves. I do not believe that I am entirely right, but I feel that I have tried to be right and honest, and if I have made mistakes I hope the general average of all our work combined will give such a large amount of material to draw averages from that the real, absolute, naked truth will be given to us without fear or favor.

Dr. B. HOLLY SMITH. I want to offer a resolution. I want to say that I think we as a professional body, in close proximity to this great enterprise, the Jamestown Exposition, should take a vital interest in the dental meeting that is to occur as one of the features of this exposition, and I move, with your consent, that a committee be appointed from this union meeting to arrange as a substitute for our annual meeting next year a joint meeting with the Jamestown Dental Convention.

The motion was carried.

The next order of business was the reading of a paper by Dr. JOSEPH W. WASSALL, Chicago, Ill., on "Extensive Gold Inlays and Their Application to Bridge Work."

[This paper will be printed in full in the issue of the DENTAL COSMOS for July.]

Dr. HOLLY SMITH. I would like to move that the society extend a vote of thanks to Drs. Wassall and Head and to the other guests of the society.

The motion was carried.

On motion the meeting then adjourned until the afternoon session.

Afternoon Session.

The meeting was called to order Saturday at 2.30 P.M. by the president, Dr. Kelsey.

The first order of business was the reading of a paper by Dr. RICHARD GRADY, Annapolis, Md., on "Oral Hygiene in Public Schools and Institutions: What are We Going to Do about It?"

[This paper is printed in full at page 559 of the present issue of the Cosmos.]

Discussion.

Dr. C. J. GRIEVES, Baltimore. I think that both the state of Maryland and the District of Columbia should be very proud of the persistent and intelligent way in which Dr. Grady has handled this subject. I am the *ex-officio* member of the committee referred to, who rendered a minority report in Maryland, and it must be interesting to you to know the ideas of the member of the school board whom I approached. Dr. Grady has named some of them. The man was absolutely prejudiced; he questioned the motives of the committee, pointing out how inexpedient their recommendations would be at that or any other time; that the plan was parochial and that the parents would object; that the public schools were not in the best of repute anyway. He gave me assurances of the failure of the hearing, and I rendered a report that it would be inadvisable at the time. I entirely agree with Dr. Schooley that we must educate the school boards by reaching them personally. We certainly number them among our patients, and they at least would not question the motives of the professional man they have retained. Members of dental societies counting among their patients members of the school boards should be standing committees of one from their respective societies. Dr. Stiff has been successful because he was known personally, and had served as a member of the Richmond school board. I heartily commend the movement, and think Dr. Grady should be praised and given every support possible.

Dr. CHARLES DIEDEL, Washington. I wish to thank Dr. Grady for bringing this matter to the attention of our local society in such an explicit manner. It should be the duty of the dentist to strive to impress upon the public the benefits to be derived by making oral hygiene an essential part of public school education, and this can best be done through special committees appointed by the dental societies. We must work to demonstrate to the public and to the school authorities the need of protecting the health of chil-

dren. Elementary general hygiene has been for some time a part of the education of children in the public schools, and the adding of oral hygiene will increase their knowledge of the teeth and their functions, and promote their proper care by the children themselves. The very fact that the text-books on physiology and hygiene used in the public schools today are so deficient in this respect is of itself an incentive for proper efforts in the direction of public dental hygiene. The National Dental Association and our local society working in harmony along these lines will cause the public to view our efforts in a broad way, inasmuch as they are instituted for the good of mankind.

I cannot give better reasons for this project than those incorporated in the report of the essayist, Dr. Grady, to the National Dental Association in 1901, as follows: "The suggestions towards popularizing oral hygiene have everywhere been received with favor. General knowledge of the causes of dental evils, and of the means of preserving the teeth by regular care, ought to form a part of the teaching of general hygiene in the schools. With the supporting influence of this National Association and the mutual co-operation of the state and local societies with school boards, it is unquestionably true that children can be instructed in oral hygiene. The most important argument in favor of the examination of the mouths and teeth of school children is the educational benefit it would be to the community. Is it not the duty of the school to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the school to train people to live better—is not this the true purpose of the school? The logical place to begin this is with the physical life of society—the one phase of life that has been most ignored by our educational methods."

I cannot add much to that report, as it sets forth concisely the main reasons for the proposed action. How best to accomplish this would be by the society indorsing its purpose rather than by a

committee appearing before the school board or board of education with argument and data to support its contention, and I am sure with proper credentials placed before the school board, we have an excellent opportunity at this time to bring the matter to their attention.

Dr. H. C. THOMPSON, Washington. A number of years ago the incentive given to the importance of the study of oral hygiene in public schools was started by Dr. J. H. P. Benson at one of the meetings of our local society. The society took up the question, appointed committees to wait upon the powers that be, and secured their concurrence in our efforts to put before the schools a treatise on oral hygiene—a text-book for the instruction of school children. We proceeded very carefully and thoroughly, until we had compiled an instructive, plain, simple treatise on hygiene, and thought we were succeeding, until the late Dr. Noble, who was the final committee on that subject, went before the authorities, and was then told that unless it could be classed as an emanation from a District of Columbia society it could not be published, but that it must be under the control and to the credit of the superintendent of the public schools. We went farther. Our idea was to appoint a series of committees for the purpose of giving simple lectures along the line of oral hygiene. Some of us did lecture, but when the literary scheme dropped, everything else dropped. We saw that they wanted to eliminate the professional factor from the work, inasmuch as they insisted upon giving to a layman the credit for the book, and to have done so would have eliminated the very value we wanted to attach to it. Now comes the question as to how we will accomplish this. It will not be with this present board. We have approached the authorities, and they first encourage us and then discourage us. The physicians—who gives the physicians of our city and other cities the right to go into a school and examine the mouths of school children in order to see that the microbe of contagion is not present in those mouths? Does the visit of a physician to a school

imply that it is a charitable organization? Is it not for the purpose of educating the public at large? When we can secure the concurrence of the medical profession in our scheme for teaching and practicing oral hygiene in the public schools for the benefit of the public health, then will we be able to approach the authorities who can determine whether it should be taught. Our city authority in Washington is Congress, and unless the physicians abet us in this project we may as well cast our hopes to the winds. It may be asked, Why make such a talk over oral hygiene when neglect gives us work? That of itself should eliminate any question of commercialism. If we teach oral hygiene in the public schools, we are abolishing the very causes that produce work for us.

Dr. R. O. SADLER, Baltimore. I simply want to add my word of commendation to what has already been said on this very important subject. It is a question that should interest all mankind. The children of today are the grown folks of tomorrow, as someone has said, and if we can take care of the physical being of the child today—make him strong and robust—it stands to reason that he will be a strong and robust adult a few years hence; and I know of no better starting-point than the care of the mouth and teeth. I have seen some children's mouths that at the ages of six, seven, and eight, looked more like cesspools than receptacles for the transmission of nourishment to the human body.

We are, or should be, educators of the people—the legitimate educators, along the lines discussed in Dr. Grady's paper and the remarks that followed—and we must keep working on this very important subject until we shall have won the people over to our way of thinking. I am convinced that from birth to old age many cases of disease, of much discomfort, and many instances of premature death, are brought about by unhygienic mouth conditions. I know that all conscientious practitioners try to impress the importance of this matter upon the people who come under their immediate care, and, as Dr. Grieves said, we should

never lose an opportunity of putting in a good word on this very important subject; we all can drop a word here and there that will bring good results. It is a matter of education. I say, with a blush of shame, that I was fifteen years of age before I ever had a tooth-brush in my mouth, and I did not know what I was missing until I began to use it. I suppose, now, I am as enthusiastic on the subject of oral hygiene as any man in the room, and I do know that by persistent effort we can bring about great good.

Dr. M. C. TRACY, New York. I am unfamiliar with your methods of examining the teeth of children in public institutions, but in New York there have been established several dental clinics in the medical departments of the hospitals, and it has been my pleasure to be connected with one or more of them since I have been there. Within the last year Dr. W. D. Tracy and myself have established a clinic in connection with the Nose, Throat, and Lung Hospital. We treat only those cases that are among the very poor, the financial condition of all applicants being examined into before treatment is given. The board of health are becoming interested and are sending us cases. To improve the care of the teeth among the poor is as important a measure as any that may be instituted on medical lines. I realize from experience that a large majority of the diseases of the nose and throat arise directly from diseased teeth, and if we can teach and accustom children to care for their teeth at a time when they are unable to pay for dental treatment, we are doing much good in a field which it is impossible for medical men to reach. Many dentists in New York are becoming interested in this work, and we hope for a great advancement in the near future. Personally, I cannot see why dental and oral hygiene is not as important as any branch of medicine, and why it should not progress as rapidly.

Dr. DIEDEL. Before Dr. Grady closes his discussion I would like him to give us a brief outline of his experience, and that of others, in approaching the board,

and to answer his own question: What we want, why we want it, and the best way to get it.

Dr. GRADY (closing the discussion). I confined myself in my paper to a general discussion of the subject, eliminating statistics or such details of the work as I had written out before. As to converting members of school boards, I would say that I never have trouble in converting teachers; and as to the medical men—in Baltimore and throughout the state no trouble was encountered in endeavoring to influence them in behalf of oral hygiene. A resolution was adopted at my suggestion by the State Medical Association, in which the association declared itself unanimously in favor of the teaching of oral hygiene; and the Public Health Association also adopted a resolution recognizing the benefits of oral hygiene. The most striking data I have found on the subject of defective teeth, I discovered in a recent issue of the *New York Sun*. There had never before been undertaken a systematic examination of children's teeth in New York, and the test results in the city schools were surprising. Out of 13,941 children examined in four primary schools, 6294 required medical attention for some abnormal condition. This examination was carried on by one hundred inspectors. The worst city districts were avoided, and as one doctor examined but six pupils per day out of the entire number examined you can appreciate the fact that it was not done hastily. This is the complete result: The total number examined was 13,941. Among these the following pathologic cases were encountered: Bad nutrition, 1092; swelling of glands, 2602; bad teeth, 3413; deformity of palate, 196. Now you know that if medical men found 3413 with bad teeth, the dentist could have multiplied the number. The result of the examination of the teeth is, I think, the most remarkable feature of the general medical examination, as it points to the necessity for medical inspectors to include in their examination a careful examination of the teeth. Entrusting this work to any but dentists, or to those trained in dental col-

leges, would be a failure. An effort was made to examine the eyes of children, and it was done by the teachers themselves—which was an opprobrium to the medical profession, the work being put forward as done by oculists, who, as a fact, saw but a small fraction of the total number of the pupils. When we appeared before the school board in Baltimore, we said that we wanted to make the dental examinations ourselves, so that it should not be a slipshod investigation.

The point brought up by Dr. Diedel is really too lengthy for discussion, but possibly I can answer what he asks under two heads: First, what do we want, and second, why do we want it?

We want periodical and systematic dental examinations of the teeth of children in the primary and grammar schools, whose ages range from six to fifteen years. It is not proposed that the examinations be made by the school authorities, but by dentists, and at such times as shall not interfere with school work or lay a burden upon the teachers. Dentists who are members of dental societies and members of the graduating classes of dental schools, and who are recommended by the deans, could be the voluntary inspectors. Their reports (charts) should be given to the pupils, with instructions to hand them to their parents or guardians. The form might include the words, signed by the teacher, "Your child (or ward) has been examined by the visiting dentist, and you are respectfully advised to have his (or her) mouth and teeth attended to."

Answering the question, Why do we want instruction and inspection to prevent sacrifice of children's teeth, and the accompanying effects on their health? I would say: Take it all in all, care of the teeth pays—in comfort, in beauty, and in the conservation of health from youth to old age. "Better take pains than have pains take you."

It has been shown that ninety-five per cent. of children have their permanent teeth in a carious condition, from two to sixteen teeth being affected. The magnitude of the evil appears at the simple

mention of this fact. Can children with carious teeth grow into healthy adults? Can a race thrive whose children are so afflicted? When one has attained full growth, it may not matter much whether the food is masticated by natural or artificial means, provided it is properly done; but with children it is a different matter, and the state of our children's teeth is a question of national importance. Among those suffering from chronic indigestion only two per cent. have sound teeth.

Relatively few children have had their carious teeth properly filled, and those under ten years of age rarely have received any dental treatment other than the extraction of loose and aching teeth. Why is it that so large a percentage of our children—school children—present distorted features, often due only to the untimely and injudicious loss of teeth, both deciduous and permanent? Because of ignorance or neglect.

The teeth and mouths of many children are in an unhealthy and disgusting condition, which not only injures their own health, but also that of the teachers and children who are compelled to sit with them, it may be in overcrowded or ill-ventilated rooms. It should not be difficult to impress teachers with the dangers which attend the exudation of pus from abscessed teeth. In every community there are those who are enthusiasts on the subject of pure and wholesome food, but whose mouths are in such neglected conditions that the air which passes through them is polluted, and every mouthful of food swallowed carries bacteria with it into the stomach. The almost entire futility of sterilizing articles of diet for patients in whose mouths chronic abscesses exist, or whose teeth are covered with tartar mixed with mucus and food in a state of decomposition, need hardly be mentioned. A source of danger from decayed teeth is the possible introduction of parasites into the tissues with which the teeth are connected. Parasitic organisms are numerous in articles of food, and as it is very difficult to prevent small particles of food from lodging in the cavities of

caries teeth and there undergoing decomposition, it is not impossible that by such means—especially if the cavity be in the root-canal of a pulpless tooth—parasites might enter the soft tissues.

There is also another source of danger to children in the exchanging of pencils and chewing gum, which, after being in mouths mixed with pus, are placed in the mouths of other innocent and unsuspecting children. These practices may be democratic, but they are vicious.

Girls whose teeth are defective will in a few years be the mothers of the next generation. What about the claims of their children, unless we now do our duty by the future mothers, and give them a chance to grow up as healthy women? Dr. D. Hayes Agnew said, "The world is becoming filled with a class of flat-breasted, spindle-limbed young women, unfitted for the varied responsible functions of womanhood; qualifications, too, which under a different regimen and directed into proper channels would exert a most potential influence on all the great social and moral problems of the age."

There is another point I will mention before closing: Dr. Sadler gave his personal experience—and now he is a professional dentist! I just want to call your attention to what Dr. Sadler said—that he had reached his fifteenth year before ever using a tooth-brush.

I recall a case of a young man sixteen years of age, who had no lower molars on one side; who had a polypus growing out of an upper molar, a polypus growing out of a lower molar, and besides had sixteen cavities in his front teeth, none of which had ever been filled. This young man grew to be nearly seventeen years of age with sixteen cavities in his front teeth, no lower molars on one side, other molars defective—and yet he was the son of a physician!

As to another young man, I was surprised at his being so undeveloped. With the exception of two, every tooth in his mouth was filled. "How much do you weigh?" I asked. "One hundred and twenty." "How tall are you?" "Five feet six inches." I should say that

in the U. S. army the dental equipment of recruits is at least six opposing molars; and in the navy, not less than four opposing incisors and four opposing molars. I could show you a chart of a young man who has not a single molar on one side of his lower jaw, and only two natural opposing molars on the other side. It is extremely unfortunate that these things happen with our young people, because the loss of teeth, or the presence of teeth with multiple cavities, may cause their rejection later, if they should seek admission into the army or navy, or civil service, where the necessity for the selection of men who are sound in all respects is self-evident.

Dr. C. C. HARRIS, Baltimore, then read the "Report of the Committee on Operative Dentistry," as follows:

REPORT OF THE COMMITTEE ON OPERATIVE DENTISTRY.

The operative section of dentistry comprises the care and preservation of the natural teeth and adjacent tissues. It is so broad a subject that I shall simply attempt to describe a few personal observations of routine practice. Particularly as affecting the permanent teeth, the trend of the profession seems to be at the present time toward prevention more than heretofore. To this end the highest state of cleanliness is the aim, and this should be accomplished by the individual through frequent cleaning of the teeth with a brush, and such adjuncts as antiseptic fluids, pastes, soaps, and powders. The one thought to be borne in mind is that teeth decay through the action of the acids resulting from the decomposition of food particles; through the acids contained in foodstuffs, or through those contained in the oral fluids. An absolutely clean mouth is almost an impossible condition, because of the never-ending fermentation; yet we must admonish as to frequent washing of the entire mouth, including the gums and all mucous membranes.

The dentist may be of assistance in this work by removing all deposits, and by giving such advice and treatment as

will keep the fluids of the mouth in a normal condition and the gums healthy, impressing on his patients the thought that healthy gums usually mean healthy teeth, and that all calcareous deposits and food particles irritate and inflame the gingival tissues.

As a prophylaxis against decay, the practitioner must observe closely all teeth as soon as they are erupted, and give such mechanical attention as may be required. The deeper fissures of all molars and bicuspsids must be broadened and filled with cement—with the assurance that one, two, or three years hence, as this cement wears away, the teeth will be harder and better able to resist decay. Cement will preserve such fissures through the period when children are careless and inefficient with the brush. Thousands of cavities, otherwise requiring permanent fillings, are thereby preserved for years, if not a lifetime. This is preventive dentistry. Such has been my practice for twenty years, and I am sure I have thereby prevented the occurrence of many hundreds of cavities. The one unhappy feature is that parents neither comprehend nor appreciate such efforts.

I may add here that it is my practice to fill nearly all cavities in teeth of young people with gutta-percha and cement, rarely using gold until the patient is from eighteen to twenty years of age. I always use gutta-percha in the approximal cavities, and cement in the fissures. Fellowship cement proves especially efficacious in this connection, it being hard, adhesive, and setting promptly.

Our work being so exhausting, it has been my aim of late years to lessen the arduousness of our daily routine, and to be less severe on our patients. To this end all have sought to escape the laborious and difficult operations with gold. Hence the remarkable gain in popularity of porcelain and the plastics.

In regard to gold fillings, I believe non-cohesive foil to be the ideal agent for preserving teeth. I further believe that a greater degree of skill is required to do good operations with the old and original non-cohesive gold than is re-

quired in any other class of dental operations. It represents hard manual and mental labor. It was the effort to escape this "sweat of the brow" that helped cohesive gold in its great stride for favor. The necessity for so much space in working cohesive gold is responsible for the greatest injustice both to the qualities of the gold and to the skill of our profession. We discarded the teaching of our forefathers (who worked non-cohesive foil) that nature could not be improved by artificial means, and so cut and slashed into tooth-structure—until many good operators fell into the delusion of believing that conspicuous gold fillings were real works of art. The public were educated into this belief until many intelligent, if not overly refined people, demanded such operations.

Cohesive gold thus proved a curse, by lessening artistic taste, refinement, and culture. With those large monuments to our manipulative skill, and shell crowns on the anterior teeth, my mind often questions to what degree our claim to culture and refinement exceeds that of the Fiji Islander, with large rings in the nose and ears.

Extremes teach useful lessons, and now both the profession and public have revolted, with a tendency to imitate and help nature. Of late we have with porcelain inlays and porcelain-backed crowns approached the highest state of dental art. Porcelain art has been perfected and has taken a permanent place. I want to say that the few men now living who have mastered the working of Abbey's non-cohesive gold, at its best, will never know the necessity for much porcelain work. Most exquisite and excellent work is done with porcelain, yet it can only be an adjunct, and never occupy a very important place with such of us as work non-cohesive foil with average skill.

Porcelain owes its birth and popularity in great part to the abandoning of the inconspicuous non-cohesive operations for the overdone and necessarily conspicuous cohesive gold work. There can be little question in any dentist's mind who has really mastered both, as to which preserves the teeth better.

Evolution and present-day culture may eventually bring non-cohesive gold into popular favor again, as soon as the present spasmodic cycle of enthusiasm over porcelain assumes a conservative form, and places it where it really belongs.

I am doing a few very satisfactory porcelain fillings, and am delighted with them, yet feel confident that porcelain is being over-used and that a few more years will limit its use to certain definite cavities. The large, conspicuous fillings of gold were so overdone that gold crowns on the anterior teeth came easy, and this magnified the state of affairs until the profession saw the absurdity and uselessness of both, and hence we are now endeavoring to imitate nature as much as possible. I hope to see the profession take up non-cohesive gold with renewed energy, for in that way we will avoid conspicuous fillings and add to the permanent quality. Years ago much complaint against this gold was in regard to the dark shadows thrown by it between the teeth; but this was due to too much filling, before the day of separating as now practiced. This same darkness is complained of with porcelain fillings, and can be overcome by V-ing the space from the labial to the palatal surface, thus permitting the light to enter between the teeth from the rear. The space should never be paralleled in order to avoid that unsightly shade effect. Try it and be convinced.

I hear much complaint of darkness in pulpless teeth. In this connection I will say that I have recently seen a central incisor filled with Abbey's gold by Dr. Volck over twenty-five years ago for a then young patient. The root and crown are still of good color. I have always used this method and believe it to be superior to all others in the filling of teeth. If you want success in the treatment of pulpless teeth, as exemplified by good color and freedom from abscesses, looseness, and recession, fill the roots solidly with non-cohesive gold. I hope there are others, but fear that we have in Baltimore the only schools that teach the manipulation of non-cohesive gold. There are thousands who never saw it,

and others who never mastered it, and thus have no right to utter a word in opposition to my statements. Personally, I combine cohesive and non-cohesive gold in nearly all fillings, rarely permitting the cohesive to come in contact with tooth-structure. The present trend will, I fear, make high-class operations a lost art, porcelain and crown work coming to the front, but to the patient's detriment, I warn you. My knowledge of porcelain being limited, I will leave the subject to many who will clinic and otherwise discuss it and the subject of gold inlays.

Except to give full credit for the excellence of much work on these lines—as a preserver of teeth—I cannot feel that the “system” will ever rank with gold; that has proved its superiority for a century. It behooves us to beware of fads. I must say in connection with the fads introduced into gold work—such as the fiber golds and the working of gold with ivory points without force—that all such are most hurtful to our profession, and that no gold can be made to protect indefinitely tooth-structure if it be not condensed with real force, whether by hand or mallet. A cavity cannot be hermetically sealed by smearing gold against its walls.

Discussion.

Dr. J. A. WATLING, Washington. I have been very much interested in Dr. Harris' paper. I know what his father accomplished with non-cohesive gold, but unfortunately I lived in a part of the country where cohesive gold is used almost exclusively. In the state of Michigan, ninety-nine per cent. of the profession use cohesive gold and the hand mallet, but with that material I honestly believe that we are making good successful operations. I differ with the essayist on the method of filling the fissures of the permanent teeth of children with cement. I would not use that material myself, but would use tin foil in preference in children's teeth, as I think it is one of the best filling materials one could use. I find that very few operators in the South use tin foil. I believe it to be one of the best preservers of teeth that

we have. It is manipulated like soft gold, and there is nothing superior to it. It is claimed that it possesses a certain amount of therapeutic value in the preservation of the teeth, and for those of the children it is especially recommended. I am in the habit of using tin foil at the cervical borders of large cavities, and at the approximal margins of cavities between molars and bicuspid. I first fill the cavity half or two-thirds full with tin foil, and then on the occlu-

sal surface finish the filling with cohesive gold. Such a filling will last for many years, and besides is less expensive than a filling made entirely of gold—a point that has to be considered in the case of many patients. While I was actively engaged in teaching, students were required to use tin foil to improve their manipulative ability.

There being no further business before the societies, the meeting was declared adjourned until the next annual session.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, February 1907.

A REGULAR meeting of the New York Odontological Society was held at the Academy of Medicine, No. 17 West Forty-third street, New York city, on Tuesday evening, February 19, 1907. The president, Dr. Turner, occupied the chair, and called the meeting to order.

The PRESIDENT. The subject of the evening is—"Does the Cemented Filling Preserve Tooth-Structure Better than the Filling Inserted Without Cement?" We will hear first from Dr. I. N. Broomell of Philadelphia.

Dr. BROOMELL. A short time ago, I had the pleasure of attending a meeting of the Franklin Institute in Philadelphia. This institute, as many of you know, is a highly scientific body of men. On this occasion they had under discussion the subject of hydraulic cements and their use. I was particularly struck by one feature of their discussion, namely, their use of the terms *cem'ent* and *ce-ment'*. I thought perhaps we might take a lesson from what these men had taught me, and use these words correctly, *cem'ent* meaning the substance and *ce-ment'* the act of cementing the filling.

Dr. Broomell then read the following paper:

DOES THE CEMENTED FILLING PRESERVE TOOTH-STRUCTURE BETTER THAN THE FILLING INSERTED WITHOUT CEMENT?

The forces which are considered responsible for the failure of fillings, of whatever kind, are of three varieties: mechanical, physical, and physico-chemic. The latter being perhaps most frequently involved, I will discuss it first.

Naturally, the first thought in connection with a cemented filling is the cementing substance, which implies any plastic material capable of becoming hard and of binding together the inlay and the cavity walls. This must receive attention primarily as to its effect or influence upon the vital tissue with which it comes in contact, and secondarily as to its ability to hold the inlay or filling in position.

Let us consider the effects of the cements now so generally employed, upon the tissues of the teeth, and compare them with the effects which follow the use of malleted gold, amalgam, or non-cemented fillings.

No doubt the gentlemen who will discuss the subject from a negative standpoint will call attention to the baneful,

irritating, and devitalizing effects which sometimes follow the introduction of zinc phosphate cements against the surface of the dentin, and they will speak of this as one of the chief reasons why cement and cemented fillings are most frequently contra-indicated. While we may agree that irritation and finally loss of vitality do frequently follow such a procedure, some of us have full belief in the theory that when this does occur it is usually due to the use of commercial metallic zinc, containing certain impurities—such as the arsenic compounds. Those who oppose this belief admit that arsenic can be, and is, found in zinc cements. This does not occur, however, when glacial phosphoric acid is used. It is highly essential, therefore, that both the zinc oxid and the phosphoric acid be pure; first, because when the irritating effect is reduced to the minimum there is a marked difference as to thermal changes, while at the same time the cement is much more durable.

It is a well-known fact that phosphoric acid has a very strong affinity for water, and that about the first thing to take place when zinc oxyphosphate comes into contact with dentin is the sudden abstraction of a certain amount of moisture from the contents of the dentinal tubuli. This question, therefore, will naturally arise: Is the desiccation or dehydration of the dentin advantageous or otherwise? In normal dentin we may answer promptly and positively that it is not advantageous, but in pathological dentin, or in dentin closely associated with the carious area, I believe such dehydration to be advantageous, and my reasons for so thinking are these: All those delicate processes which reach out from the pulps and have their endings in the zone of infection become irritated, and this irritation is followed by an over-stimulation of the cells concerned, which in turn results in a diminution in the caliber of the tubuli by a thickening of their sheaths. All those tubuli which open upon the surface of the cavity of decay are in a pathologic condition to a marked degree, and will serve as fertile culture fields for bacteria,

if their accumulated and contaminated moisture be permitted to remain undisturbed. And this is exactly what does frequently take place when malleted gold or amalgam fillings are inserted, and it is exactly what does not take place when a pure zinc oxyphosphate cement is placed in contact with the dentin.

The foregoing remarks conclude my argument with regard to the influence of a cement or a cemented filling placed in contact with vital tooth-structure.

Just a few words as to the stability and solubility of the cement, both of which have much to do with its ability to firmly and more or less permanently hold the inlay in place. We are all more or less familiar with the tests which have been made from time to time regarding the possibility of oxyphosphates being penetrated by moisture. While the majority of the cements were penetrated, there were always one or two that withstood the test and were not penetrated. This proves, therefore, that it is possible to produce a cement that will withstand such tests out of the mouth.

In all such tests it must be remembered that an extent of surface is exposed to the action of the penetrating medium, thus favoring osmotic action, while in the case of a cemented filling this action is materially interfered with by having the exposed surface of the cement reduced to the minimum. While we are compelled to admit that with our present cements there may be a destruction of the cement about the margins of the joint, at the same time I believe we can safely say that this destruction has its limitations. It may be accounted for as follows:

If lactic or other acid solutions are the chief agents concerned in bringing about the destruction of the cement, they can only do so as acids, which they will cease to be when they are neutralized through the chemical changes which are bound to take place within the confines of the sulcate-like joint through inactivity of its contents. My belief is, therefore, that a cemented filling never fails through a dissolution of the cement.

The preparation of a cavity to receive an inlay must, as we all recognize, be performed according to certain accepted special methods, just as we find this needful in cavities for malleted or plastic fillings. Admitting this, a cemented filling is better mechanically because of its binding effect upon the cavity walls, and also because it has no tendency to weaken and force asunder these walls, as is the case with the malleted filling.

A cemented filling is better because it supports the tooth. A malleted filling, on the other hand, is supported by the cavity walls.

A cemented filling is better because in shaping the cavity the walls are not weakened to any extent by undercuts and retaining grooves.

A cemented filling is better because in placing it the margins of the cavity are not broken or nicked and thus made imperfect, as is frequently the case with malleted fillings.

Moreover, it is better from a humanitarian standpoint; it is better from an esthetic standpoint. In fact it has many things in its favor, and few against it.

While the foregoing remarks favor a cemented filling, they must not be taken to mean that the ideal cemented filling has been found. On the contrary, I believe that the cement and the substance to be cemented are both yet undiscovered, but when they do come, the barbarous methods of the present day will quietly and peacefully take their departure.

Discussion.

Dr. W. A. CAPON, Philadelphia. The subject under discussion this evening is of utmost importance to the whole dental profession, inasmuch as the correct solution of the problem must determine what is good practice. To me the subject is of vital importance, because my whole professional career is entangled with this question to such an extent that a radical change would leave me stranded, stripped of my years of toil and energy, and back again at the starting-point—with the uncertainty which that means.

It is now twenty years since the cemented filling first attracted attention, and for a great portion of that period it was as a small and poorly nourished fire, flickering and almost out at times; but at last it started a train and commenced to ramify and consume, burning brighter and brighter in its progress. In the meantime another fireman was at work, in the person of Dr. Jenkins, whose fuel seemed more ready for ignition, for it burned brightly in the distance and gradually united with the body on this side of the ocean. This small blaze then assumed such proportions that old settlers were startled, and turned out to do battle with the dangerous intruder.

This seems to be the condition of affairs at the present time, notwithstanding the voluminous proof that cemented fillings are long past the experimental stage, and that they have stood the strict trial of a novice, and more than that, have been successful when obstacles seemed almost insurmountable. Teeth are now saved that were hitherto condemned; and patients smile and wish the dentist God-speed in his work of redemption and emancipation—redemption in the way of improved appearance and comfort, and emancipation from tedious sittings, frequently so prolonged that patients suffered from nervous collapse.

Barnum said that "people love to be humbugged," but it does not apply to dentistry. We practitioners of the more humane dentistry have shown our patients the brighter side of our profession, which is to perform operations with the minimum amount of inconvenience and physical discomfort. We have shown them that defects of the teeth are permissible only in proportion to the operator's skill. We have proved that teeth of poor structure can be saved in a satisfactory manner, and in doing so have driven the abhorred artificial substitute to the last ditch of forlorn possibilities, where it can be viewed with more leniency by time and old age.

This means to us that we have made a friend of the patient, and the Lord knows we need him. I mean by this that we then have a party to our suggestions,

one who is willing to assist us in our best efforts, one who will be loyal under some trying condition, and will lend a helping hand when failure is inevitable without assistance.

Such work as we are discussing to-night means so much to the dentist that I wonder at opposition. Dentists are frequently physical wrecks at forty-eight and fifty, and the number of those living to an old age is piteously small. You well know without words of mine that the nervous tension and general physical strain frequently reaches that point of utter collapse when an enforced vacation—frequently at the most inopportune time—is the only remedy to which the system will respond. This being an absolute fact, why not emancipate ourselves from such burdensome operations? Why not perform an operation that will give us an extra half-hour in God's sunlight and pure air, especially when that operation is legitimate, and your conscience is as free as the air you have earned the right to breathe? I have used the word legitimate, and why not? If a gold or a porcelain filling is not in that category, then where is our much-vaunted progress in dentistry? If I cannot use that word, then we have been retrogressing long before the inlay was thought of, for a cavity lined with cement has been advocated since cement was first made; forty years ago teeth were saved by this valuable agent used in this way, and many of our oldest dentists who are opponents to the inlay methods are proud of what they did in this manner.

This being an indisputable fact, why this opposition to a more complete lining of the cavity? This question I have asked myself and others thousands of times, and I answer you as I have before. It must be because the use of the method involves an assumption that teeth can be saved by other methods than that taught by our forefathers. It must be from a spirit of opposition, which is always aroused when any conservative position is attacked, particularly when the innovation has merit, and the attacking party is in the minority. History has proved

that such has always been the case in trades, commerce, and the professions; but thanks to the aggressiveness of every meritorious advancement, "right will prevail," and truth is victorious.

Now a word as to the inconsistency of much of this opposition. Opponents to the inlay system habitually contend—I say habitually, for that is the proper term—that such work is only temporary; and they point with pride to the fact that many gold fillings have been in constant use for over forty years. They try to look on those flinty old teeth as a standard, but nature will not have it, for arrayed against such an exhibit is that of the forty thousand gold fillings that have not lasted forty months—not from poor workmanship or inability of the operator to understand his material, but because of the structural weakness of the teeth. Those very poor teeth have been brought back to respectability and use by the very method so condemned.

Then again, why do many of these "dyed-in-the-wool" gold dentists use porcelain? I am not going to take them to task for it, except to ask why they tell patients that such work is permanent.

I saw a patient recently with a beautiful porcelain contour inlay on a central incisor, and after complimenting the work I was greatly surprised to find that it had been inserted by a rabid gold worker. Then I asked the patient if the dentist had told her that it was only a temporary operation, but she replied in great surprise, "Oh dear no! that is permanent work." This illustration is sufficient to prove that our opponents admit its possibility and its permanence.

Dentistry of today is made up of several branches, which gives the opportunity for any dentist to practice that for which he has particular aptitude. He may be an expert in gold manipulation, in porcelain, in orthodontia, in prosthodontia, or in the treatment of pyorrhea, or he may be clever at everything in dentistry. His methods may differ from the very smart man's who immediately opposes the newer method because it is different and not the regular way. If any dentist handling gold in the good

old-fashioned way feels that that method is best for him because of long-continued use and practice, then he should practice that way, but I deny him the prerogative to say that another method is wrong and faddish.

Followers of the inlay method are reputable dentists, with records of honesty and with unimpeachable characters, therefore it is natural that they should resent statements or insinuations that such work is not good dentistry. We hear it at every turn, and students are told this by some teacher in every college in the land; but in the face of this opposition such work has grown almost beyond comprehension.

As a matter of fact, there is no reason why we should be extremists in any one branch. Porcelain has its place and so has gold. Gold inlays are most valuable, and so are amalgam, gutta-percha, and cement; therefore let us combine discretion with enthusiasm, uniting all that is best in our several methods, and present to the world a solid front, which will add to the glory of well doing and redound to the advantage of our profession.

The PRESIDENT. The next speaker will be Dr. Joseph Head.

Dr. JOSEPH HEAD. Dr. Broomell has spoken of the pronunciation of *ce-ment'* and *cem'ent*. I believe there is that distinction in the dictionary, but until he mentioned that the Franklin Institute had decided to adopt it, I never found a cultivated architect, dentist, or engineer who ever cemented anything except with *ce-ment'*. It just happened yesterday that I was talking to a man who has been largely interested in dictionary work, and I said to him, "You fellows are very prone to bunco us into using your expressions and pronunciations; you want to direct us according to your ideas of the philological changes of words, but you cannot always do it." For instance, "Do we *ce-ment'* with *cem'ent*?" He said, "Why, my dear fellow, I do not think so; I think we *cem'ent* with *cem'ent*." That differentiation is an English perversion. It is a curious fact that this conversation happened yesterday, and while I have a profound respect for the members of the

Franklin Institute, I do not think on the question of the pronunciation of words their decree is final. Personally, until I have better authority, I prefer in the future to *ce-ment'* with *ce-ment'*.

Now about the question of arsenic in zinc oxid. Why is it there? Because the manufacturers cannot get it out by any but the most extraordinary efforts. It is in there so tight that it can hardly be pulled out, not even by forty-horse power. It therefore is not going to get out and do any harm to the pulp. In the first place, we know it does not do any harm; in the second place, we know it could not if it tried; so I do not think we need be worried about the arsenic.

Now the question of the penetration of cements by moisture. We know that there are some few cements that are not penetrated by moisture. Every manufacturer has that cement—the trouble is that every manufacturer hasn't it! They are all impervious to moisture, if you believe what the manufacturers say, but I have yet to find a cement filling that upon being cut out with a bur does not give some odor of decomposition during the process of burring out; and I will leave it to you whether you have not all had that same experience. That does not mean that cement does not preserve the teeth, for we know it does. To say that it does not would be to go on the principle on which railroads were run many years ago. They went about five miles an hour, and were considered very rapid. One man figured out that it would be very dangerous to increase the speed, for according to his calculation a man who would ride in a train speeding at the rate of fifteen miles an hour would lose his breath.

The fact is, all cements preserve the teeth, as a rule, and when that is admitted it is not very difficult to imagine why a cement that may be more or less porous will preserve the teeth. When the bacteria that attack tooth-structure penetrate a porous cement, they resemble an army let loose in the desert—an army deprived of its commissary. They sit down and wonder why they ever went there.

Now, when we come to this everlasting

cement line, we know if we have a coarse cement line it will dissolve out quickly. If we have a fine cement line it will not dissolve out—the reason why does not make much difference. One fact is worth a pound of reasons, and the question comes down to this—we know the fine line will last. I think I can give a slight reason for that. If you have a line fine enough for capillary attraction, the solvent portion of the saliva dissolves it slightly, but a mucous plug immediately gets into that very narrow depression, which prevents the further entrance of the solvent material in the saliva. If you have a broad line of course there is a wash, and the mucous plug is not effective.

Concerning Dr. Capon's remarks, inlays of green jade have been found in the teeth of prehistoric man. Inlay workers historically have the gold-workers beaten to a standstill. I do not know that all our fillings will last that long—perhaps our patients won't die soon enough; but after all, even before Dr. Timme and Dr. Land made the metallic matrix, porcelain plugs were inserted in teeth.

Regarding the gold filling lined with cement, and the gold filling made without cement: While I do not mean to imply that additional improvements are not possible, I do believe that the combination of gold and cement, properly used, is as near an approach—barring color—to the perfect filling as we have ever reached, and this filling is made in the perfectly simple way that has been often described.

After the cavity has been prepared with proper outlines, and treated antiseptically, take moss fiber gold and anneal it properly; drop a few drops of the zinc oxyphosphate in the bottom of the cavity, put the gold right down on the cement, and squeeze the latter all out, rapidly and firmly, without regard to the edges. Having squeezed the cement out, and having pressed the gold down so that the filling will have sufficient density to stand the hammering and prove a perfectly hard filling when finished, rapidly fill two-thirds of this cavity with gold, using a firm pressure, and let the cement

set. After that is done, work the gold up to the edges, clean the edges of cement, condense the gold in the cavity, and rapidly hammer more gold in until the filling is complete. In that way we have the entire cavity filled with gold, which is stuck to the cavity walls with cement, except at the margins, where union of the gold and enamel is as near as it is possible to have it. When the cement is used in this way, we produce a filling having the advantages of the inlay and of the old hammered gold filling.

Take the figures that Dr. Black brought forward in 1895. He made tests, as we all know, on the specific gravity of gold fillings. He found that hammered gold may attain a specific gravity of 19.41, while that of cast gold is 19.36. He then obtained thirty-five fillings made by well-known dentists, and found that among the lot the highest specific gravity was 18.9, and the lowest 10.7. The average filling had air-spaces to sixteen per cent. of its entire bulk. It is not at all difficult, under these circumstances, to see why in many instances, when decay starts at the edge, it soon gains the bottom of the filling, never showing until the filling is entirely undermined and the whole tooth so badly decayed that the undercuts actually are softened and the filling drops out. These air-spaces in the filling are of course comparatively harmless, like those in cement, but the air-spaces next to the cavity walls are real sources of danger, and these the cement surrounding the cavity walls fill up.

Many a gold filling has the reputation of being a good filling eight or ten years longer than it deserves, and I believe there are many that appear to be good at the end of one year, which are in reality already on the road to destruction. When we ponder upon these average fillings that Dr. Black tested, with air-spaces in the gold and air-spaces between the gold and the tooth-walls, it is not difficult to understand why they should be failures in so many cases. The wonder is that gold fillings have given as good results as they have.

The whole question may be summar-

ized thus: With the cement used as I have described, after the filling is finished we know that we have perfect apposition of the filling with the tooth, and with a hammered gold filling we know that we have not perfect apposition. We may say that we have perfect apposition, but we know we have not. When we take into consideration the well-known fact that a filling only preserves a tooth by excluding the bacteria of decay, we cannot but feel that a filling made with cement, as I have described, is a hundred-fold better than the old-fashioned hammered gold filling.

Dr. S. G. PERRY. Dr. Dwinelle used to say that dentists are "calkers." His meaning was that the office of the dentist, strictly speaking, should be that of the ship-builder who calks his deck and makes it tight, his idea being that the tight filling was the one that saved the teeth. Dr. E. J. Dunning used to say that the particular thing which was necessary in making a good filling was "perception at the point!" That was the exact term he used, by which he meant that attention should be fixed upon the ultimate point, and that the gold should be condensed in such a manner as to make an absolutely tight fit, because we know that it is the tight fit that saves a tooth; and we know also that it is a very difficult thing to pack gold so accurately as to get the absolutely tight adaptation that is necessary to save the tooth.

We also know that we can get that tight fit very easily by interposing the cement; and on general principles, considering that perhaps the majority of men are not over-accurate in their work, and the exigencies of daily practice are such that one cannot always do the ideal operation, it may be that it is better that the practice of putting in cements in one form or another should be encouraged, because a better result will certainly be obtained.

In packing the gold one has to consider the entire inner surface of the cavity, and the adaptation has to be over all that surface.

In working with cement the filling material itself takes care of this phase of the work. You have only to take care of

the adaptation at the margin, not for the purpose of saving the tooth so much as to protect the filling from wasting. That is the office of the gold filling when used as a veneer.

In reference to the making of inlays of one kind or another, and placing them with cement as we do, I think there has been a very great advance made since the introduction of the porcelain inlay, and a still greater since the gold inlay was introduced.

Of course we know that porcelain is brittle, and is liable to crumble off at the edge. Experience has shown that this is obviated with the gold inlay, which has a good edge and a soft, pliable quality which enables one with the burnisher to adapt it very accurately to the edge of the tooth. I am sure as durable a filling can be made after the gold inlay has been placed as could possibly be made by using the old-fashioned method of semi- or non-cohesive gold. I presume as accurate a fit can be made by the burnishing of the gold inlay as can be made by malleting the filling in the cavity. If that be true, we are justified in using the gold inlay wherever we can. There is perhaps this exception—that of course the opening into the cavity must be large enough to allow the inlay to go in, and such being the case, it is large enough to allow the inlay to come out.

There are many teeth where considerable cutting is necessary to open the orifice of the cavity sufficiently to allow of the insertion of the gold inlay, and in some of this character my preference would be for the old method of filling with gold, because I would not have to make such a large opening or destroy so much of the tooth-substance, and with sufficient care and patience I would be able to get a satisfactory adaptation. I have always disliked the cutting, slashing, and destroying of the substance of the teeth. I always feel that I can never substitute anything quite so nice as the natural tooth, although of course we know that the gold filling can be made to outwear natural tooth-structure. I shrink from doing that tremendous cutting, so that on approximal surfaces in

the posterior teeth I still insert gold fillings in the old-fashioned way, remembering that fillings were made by the older operators forty and fifty years ago, and even sixty and almost seventy years ago, that are doing good service today.

When I see fillings doing well that I myself put in twenty-five, thirty, and even nearly forty years ago, I cannot help but feel respect for that old practice, and am sometimes willing to undergo the extra fatigue in putting in that kind of filling, because I feel that when it is done it will be as permanent as anything that can be made.

I think that on approximal surfaces gold inlays are superior to porcelain inlays, but that is a proposition that need not be discussed, because it is self-evident, and it is one of the reasons why I think that the improvement made by Dr. Taggart will be of great importance to us. I think that these gold inlays will be used in the posterior teeth almost exclusively, since they can by this method be made so accurately as to constitute the absolutely ideal operation—that is, if they be placed where the gold does not show. I look for a very great advance in this direction.

We hear men sometimes say that there has not been any advance made in dentistry. Almost every day brings some advancement. We start off on a higher plane, so that we forget, and we do not quite realize how much advance has been made.

I do not think the price of operations has increased as much as it should, considering the increase in the cost of living.

I have always felt that Dr. Royal W. Varney reached the high-water mark in filling teeth and saving them. But you know he died almost from overwork, and a system which calls for such a degree of self-sacrifice is one which in practice cannot be advocated, because we would not find throughout the profession a great number of Royal W. Varneys. We will find a great many men who can do good work with cement as the foundation.

I am entirely in accord with all who are in favor of the cement filling.

In reference to the danger from ce-

ment, I have never been afraid of arsenic. I think Dr. Head has clearly stated the facts of the case. Because it is locked up in the teeth, the arsenic is not a source of danger so far as I have been able to observe. I think the greatest danger is from the infection which naturally follows the process of decay, and it sometimes happens that the pulp dies.

My method has been to interpose a little English wood creasote, made into a pasty mass with zinc oxid, between the floor of the cavity, pretty well out toward the edges, and the zinc oxyphosphate, thus availing myself of the disinfectant properties of creasote. I have found after many years, when these fillings have come out, or where I had an opportunity of observing a cavity treated in this way, that the teeth remained in a healthy condition. I many times found dentinification such as we see under cement fillings.

In the first paper I ever ventured to write and read in public—I dare not tell how many years ago; it was before the introduction of zinc oxyphosphate—I advocated zinc oxychlorid for large cavities. I recall one gentleman who said to me, "If you do that you will be accused of not using gold throughout; you will be accused of deceiving your patient."

I kept on, however, and from that time to this I have lined the floor of large cavities with cement—the oxychlorid when it was the only available cement, and the oxyphosphate upon its introduction. Never did I fill a large cavity except in this way.

Dr. T. E. WEEKS. I was brought up on gold, and I have the consciousness that I was possibly slow in changing my mind and adopting the belief that a cemented filling was better in many cases than the hammered gold one.

I have seen many in the latter years of my practice that were beautifully done, of a high specific gravity, that failed because of the injury to enamel and dentin under the manipulation of the gold. Of course that applies only to a certain class of teeth, to teeth of a

structure that will be easily damaged. We can obviate that danger by the adoption of the cemented inlay, as has been my practice for several years.

In this connection I am moved to speak of a belief I have had that, regardless of the nature of the operation, too many fillings, so-called permanent fillings, are inserted before the teeth are in a condition to receive them.

The affected area in cavities should be thoroughly sterilized, the pulp and vital portions of the teeth protected from thermal changes, and the teeth given sufficient time to regain their normal positions before the permanent operations are performed. That would not always hold true with cemented fillings, but with all metallic fillings I am sure that a preparatory treatment of the tooth, by inserting a cement filling and allowing it to remain in place as long as possible, would give the tooth an opportunity to return to a more normal condition.

Iodoformagen cement I have found very effective in those cavities which it was difficult to mechanically sterilize. Covered by such a cement, the filling will be thoroughly sterilized and the tooth will be in a condition to receive what we choose to call a permanent filling.

The other agent is copper oxyphosphate. We all know the benign influence that copper exercises over tooth tissue and the sterilizing or embalming and mummifying effect it has upon any infected area. Now, it seems to me, with a recognition of the properties of these materials, the cultivation of the necessary skill to insert fillings, and the exercise of proper judgment, that the inlay has certainly come to stay. The cemented filling has come to stay, and I hope and believe that, in the hands of the profession at large, a greater proportion of teeth will be saved with the cemented filling than has been possible with the methods employed up to the time of the introduction of that method.

Dr. A. R. STARR. I presume I am somewhat old-fashioned, and pin my faith more to gold fillings than I do to other methods of obturation, but I think

I am gradually being weaned away from that faith to a certain extent.

I believe in being conservative, and that we should select a material which we consider most suitable for the case under treatment.

If we can insert a filling in a cavity in a good strong tooth, of apparently dense structure and with good strong walls, and secure perfect margins, no matter if that filling is not up to the proper mark so far as density is concerned, I think we have something that is durable, and perhaps more lasting than any cemented filling.

I realize, however, that there are other cavities in which the cemented filling would be very much better, as, for instance, where the walls are weak, or where the cavity is very large. A cemented filling would then be more desirable and would last longer than the hammered filling.

My plea, therefore, would be simply for conservatism. Each should decide for himself the material best suited for each individual case, and select that method which would seem best to meet the requirements.

Dr. J. I. HART. There are many phases to this question, and I think we are making a mistake in getting away from the subject and speaking of inlays, either porcelain or gold.

The subject under discussion is that of the cemented filling—specially, as I understand it, the fastening of either a gold or amalgam filling to the walls of the tooth by the use of some cement, rather than the making of a filling in mass, or an inlay, and the setting of it in the cavity.

Miller's theory shows conclusively that the lactic acid-producing bacteria enter the dentinal tubuli far in advance of the time at which the softening of the dentin takes place, and I think it is the failure to recognize this theory that has caused the trouble in many cases.

I think, further, that it is phosphoric acid that irritates the pulp, rather than any possible arsenic in the zinc oxyphosphate; and if we take the precaution of varnishing the pulp-wall of a cavity be-

fore placing the zinc oxyphosphate, we will lessen the danger of irritation. I have been using the cemented fillings for a couple of years, and I have never experienced greater satisfaction in the practice of my profession than I have since that time.

I want to call attention to the use of the cemented fillings in deep-seated cavities. Where we are about to use fibrous gold, we should first place in the floor of the cavity quite a proportion of zinc oxyphosphate, and allow it to crystallize; then with an inverted cone bur the cement surface is flattened, and upon it a first layer of fibrous gold is packed. Upon this first layer of gold a small amount of cement mixed thin is added, and is allowed to harden before we proceed with the introduction of the gold.

There is more danger, I think, from thermal shock conveyed through deep metallic fillings, even though we place a small layer of cement under these fillings, than there is from any irritant in zinc oxyphosphate. Cement under amalgams minimizes the danger of dentin staining. We succeed in placing a much better amalgam filling if we cement it in the cavity, than we can possibly secure without the use of the cement.

I wish to conclude by saying that I am firmly in favor of cement for assistance in the placing of metallic fillings, and that while we recognize the care we must exercise in the use of our plugger points in relation to the margins of enamel, we must be even more careful that no cement is between our plugger point and our gold. In other words, if any small particles of cement break down around the margins, we will meet with failure; but a cemented filling carefully placed is in my estimation a boon to the patient, as well as of great assistance to the operator.

Dr. R. OTTOLENGUI. Dr. Head said it was immaterial as to the reason why the cemented filling fails, so long as we know that it does not fail, or rather, so long as we know teeth are saved by cement filling. The question has been raised—I am alluding now to inlays which are made whole and cemented in—as to whether or

not cement fails when the filling comes out, and I think it is of vital importance to know when the filling does fail, whether it has been due to a destruction or to a lack of adhesion of the cement.

Something has been said tonight of the desirability of having hydraulic cement. Now if there be any desirability that the cement should have hydraulic quality, that is an implication that we take for granted the cement may become dissolved out. I want to ask you to think for a moment what we have been experiencing in regard to all-cement fillings. We have constantly used the expression, "the cement washed out." What does that mean? A bank on a river washes out, but it does not dissolve out; it washes out by the force with which the water attacks it. The question then arises, when an all-cement filling washes out, has it been removed by stress and friction, or has it been removed by solution? I am inclined to think both of these agencies play a part in this destruction. In other words, I think the larger the area of cement which is exposed to friction under stress, the more rapidly will the disintegration or destruction of that cement filling occur. I doubt not that the cement is somewhat soluble, but I want to call your attention to the fact that however this cement is removed by the so-called washing out, you find it still adhering to the cavity. If it were left to itself it would be a lining to that cavity—would still be nearly perfect at the margin. Why, if it be attrition that is removing it, does it last longest next to the tooth and the margin? Simply because the margin protects that portion of the filling from this friction or stress. If it be removed by solution only, the same principle obtains—it is more protected the nearer it is to the tooth.

Let us discuss for a moment the play of these forces when the filling is a cemented inlay. So far as frictional stress is concerned, we have the cement now practically guarded by two edges of indestructible material—the enamel margin at one side, and the porcelain or gold margin at the other; consequently only

a very minute portion of this filling can be destroyed by frictional stress. How is a thing dissolved? I admit I am weak in chemistry, but as near as I can understand it, it is thus: You can have very little solution without motion. Take a common example: You put sugar in your coffee in the morning, and if you waited for the lump to dissolve, you would wait a long time. You produce motion by stirring with a spoon, or, in other words, you hasten the solution of the sugar by motion. Motion is thus an important element in solution. This is so true that if you take a quantity of a soluble mass and place it in the proper quantity of water, or other solvent to dissolve that mass, and simply let it stand, I believe that, in many instances months afterward you would still find undissolved material in the bottom of the jar.

I conceive that in a very minute space there must be a very limited chance for motion—that is for movement between the molecules of the solid element and the saliva—and I think it might almost mechanically be stated thus: That the intermediary would be dissolved to about a depth equal to the width of the joint. In other words, the closer the joint the less will be the depth of solution. I just bring out these points to prove that we must determine whether we most need in a cement this adhesive property, or an hydraulic quality. If there can be very little solution in these joints, then our makers of cement may as well devote themselves to giving us a cement having the greatest possible adhesive properties.

Dr. W. B. DILLS. Mr. President, I wish to express my delight at listening to these papers.

Dr. Head says that he uses soft cement, and over this semi-cohesive or mat gold. He fills the cavity up nearly to the margins, then cleans the margins off, and condenses the gold, using hand or mechanical pressure.

Gentlemen, what material best insures the preservation of our teeth? It is cement. That is the true filling, and I think the more cement we use, the more lasting our fillings will be, and the closer

we get the cement to the enamel margins and protect them, the longer the filling will last. I think up to the present time the nearest we have come to perfection in this respect is the gold inlay.

Dr. Head, I believe, would have had a more lasting filling if he had cleaned out his cavity, filled any undercuts with temporary gutta-percha, and after taking an impression of the cavity had made a hollow gold inlay; also, if he had brought the cement up to the enamel margins, and burnished the gold edges of the inlay over the cement while it was still soft.

Dr. B. C. NASH. The concluding remarks of Dr. Dills are very well for the adept in the making of inlays, but there are still a few of us who have not attained facility in that direction, and on that account I am inclined to fall back on Dr. Head's method of using cement and mat gold. Take for instance an approximo-lingual cavity in an upper incisor, where you can see through the labial wall. If you will place a layer of cement on the floor of the cavity, and upon it a mass of mat gold, using a piece of soft kid to force it into place, you can line the entire interior of the cavity with mat gold. In a few minutes the cavity will have set sufficiently to make a firm base of mat gold, which should be followed with cylinders, to cover the margins, finishing with foil or ribbons, thus obviating the objections to mat gold of being crumbly, on account of its fibrous character. I think the average operator can in that way make a filling which, while not as dense as a gold inlay, is in every way practical and reliable, and at the same time inconspicuous.

Dr. M. L. RHEIN. This subject has been extensively threshed out this evening, but there is a point or two on which I want to speak. Dr. Capon went to considerable length in speaking of the one-sidedness of many members of the profession in regard to different things. My own impression is that the tendency of the profession at the present time is to seek as nearly as possible what is best. The great danger in all advances that are made in operative dentistry is that the

fascination for anything new is so great that it makes an extremist of the user of it at the outset, and he becomes frequently too radical in his advocacy of any distinctive method. I have practiced personally for over fifteen years precisely the method recommended by Dr. Head, not only with gold but with amalgam, as outlined by Dr. Hart, and from a practical experience in this direction have considered it as the ideal way of preserving the teeth. I am not stating this as a distinctive objection to the use of the inlay, because I believe the cemented inlay has a well-defined place, but it is questionable at this period what that exact place should be in operative dentistry. While the use of the gold inlay is not new, yet it has not been used universally enough during these past fifteen years to enable us to reach definite conclusions as to its lasting qualities, as compared with those of the form of filling outlined by Dr. Head.

In my own mind, I believe that the operation outlined by Dr. Head as an ideal operation is for many reasons infinitely superior to the cemented inlay. Dr. Perry in his remarks on gold inlays spoke of the possibility, after the gold inlay is cemented, of burnishing it so as to get an effect around the margins similar to that alluded to by Dr. Head. Now the difference between this effect and the one Dr. Head speaks of is that in the case of the operation recommended by Dr. Head the enamel margin is beveled to such an extent that when the filling is completed, it is on an absolutely equal plane with the surface of the tooth, and there is no way of differentiating between the plane of the gold and that of the enamel of the tooth. If this be done with a gold inlay you produce an inequality of level between the plane of the enamel and that of the gold. This is a very important point in regard to the permanence of the inlay as compared with that of the combination filling. This condition emphasizes the necessity of keeping this particular part of the tooth in an absolutely hygienic state.

We come now to another point. It is

universally admitted that some of the cement invariably disappears, regardless of whether the joint is perfect or nearly so. Now, time alone will tell what the effect is of the loss of cement upon the thus exposed enamel rods. I have observed a sufficient number of inlays to know that in a large number of cases there is great danger of the cleavage and the breaking down of these enamel rods through stress on their unprotected margins. This is the greatest advantage possessed over the cemented inlay by the filling advocated by Dr. Head.

There is another point to which I desire to call attention. In the presentation of Dr. Taggart's inlay, which has met with such universal approbation, one of the things that has impressed us all has been the great density of the inlay. It is homogeneous throughout, and it is this point that ought to be sought after in placing in position the ideal cemented gold filling.

There is no excuse for the production of sixteen per cent. of air-space in a gold filling, if the gold is selected and inserted in a proper way. In other words, the amount of stress and strain that is to be borne by a given filling is the consideration that should weigh with the operator as to the specific gravity of the filling that he inserts. It is unquestionable whether a filling containing so many air-spaces will not yield under the stress of mastication.

I want to speak on just one other point, and that is, that although recognizing the great superiority of a filling inserted by the method described by Dr. Head, I believe that if such a filling should have one defect at any part of that filling, it would be a much poorer tooth preservative than a cemented inlay.

This is a very strong assertion, and I make it on the strength of the fact that a filling put in in this way is a complete operation. It is no stronger nor is it any more lasting than its weakest point, and this is a detriment that does not in the same degree apply to the cemented inlay. It is for this reason that for some years I have adopted the following choice of materials, a description of which may

be of benefit to some of the younger men.

I am speaking now of cavities in the posterior part of the mouth, where there are two approximo-occlusal cavities: The cavities are both prepared. After obtaining an impression of one of them, I insert in the other a filling on the plan outlined by Dr. Head. In the unfilled cavity a cemented inlay is now inserted. The first filling is as simple to insert as the inlay is easy to make. All the necessary space is available, and there is no reason why any operator should not in such a position make a perfect operation. The best operator will sometimes fail on the second operation if he inserts the second filling in the same way as the first one. Frequently, when the second filling is properly made, failure follows by inability to perfectly finish and polish the filling.

For the preservation of a tooth it is in my opinion essential that the filling should be finished just as we are accustomed to seeing an inlay finished, and it is this difficulty—that of being sure of the perfection of the second filling—that has led me to adopt the easier method of inserting inlays in such cavities. I consider this method not only beneficial, but at the same time it can be used by those of us who care to adopt it for comparative purposes.

By having in the mesio-occluso-approximal surface of a molar a cemented gold filling, and in the adjoining disto-occluso-approximal surface a cemented gold inlay, there will, after intervals of five, ten, or fifteen years, be given to the one having the care of such a mouth better opportunities to form accurate opinions on the comparative durability, than any present-day theorizing.

Dr. OTTOLENGUI. Dr. Rhein has explained why he likes a filling which is inserted in this manner with cement in the major portion of it. The main point is that in the ordinary inlay, cemented in, there might come a time when the unprotected enamel would become destroyed by cleavage. I admit that, but if you are going to make a mechanically perfect contact of gold around these

margins, why do you want any cement at all?

It is my idea that if you put a porcelain inlay in one approximal surface of a tooth, and fill the adjacent tooth with gold in the way described, in time those two fillings may come back to you somewhat in this condition: you may find a cleavage of the enamel on the incisal edge of the tooth which is filled with porcelain, but I think very much earlier than that you will find some recurrence of caries along the border of the gold filling.

I believe there is more recurrence of caries around the gold margin than around a margin which has cement over it, and that, I think, was the prime point for discussion. I believe that the inlay cemented into a tooth will resist caries longer than enamel covered with gold. There are of course places where stress and cleavage demand the protection of the enamel edges with gold.

We should use discretion, and we cannot have discretion without knowledge. I believe that no greater damage could be done to dentistry than to do away with cemented inlays, but there would be no greater disaster than to stop teaching men to fill teeth in the old way. Enamel edges should be covered whether there is an inlay or the kind of filling advocated here, and you must know where it will be safe to put in a filling entirely of porcelain, regardless of whether there is a little cement showing on the edges or not.

Dr. RHEIN. I want to make clear the point that with the method outlined by Dr. Head the margins or enamel have absolutely no cement under them; that the rest of the inner periphery of the tooth is thoroughly lined with a cement up to the marginal point, in order to get an absolutely hermetical sealing of that cavity, because it is almost an axiom among us that it is necessary to hermetically seal a cavity to preserve it.

Dr. OTTOLENGUI. You cannot do it with gold; I know I cannot.

Dr. RHEIN. The only reason Dr. Ottolengui cannot do it is because he is not willing to learn how. That is

about the only answer I can give to such a broad assertion, and I say it not because two or three fillings are preserved in that way, nor do I say that such a thing as recurrence of decay has never occurred in my practice, but that the possibility of recurrence of decay around the gingival margin of the enamel is so small—many operations going back for twenty-five years—that it is not worth considering.

Dr. OTTOLENGUI. That is, in your practice and mine, but not in that of everybody.

Dr. RHEIN. The point I want to make clear is the following: It is this little volume of cement that prevents the hermetical sealing of the cavity, and agreeing as I do with Dr. Head's idea, that there is no zinc oxyphosphate that has ever been made that is not more or less porous in character, there is no possibility of getting hermetical sealing of the cavity if cement be used at the enamel margin.

Dr. OTTOLENGUI. What is your cement there for? Why do you have any cement in that margin?

Dr. RHEIN. Because you get a better adaptation to the inner periphery of the teeth, with less stress on the teeth than can be obtained in any other way. That is the important reason for its being there, and it also acts as an interposing space between the tooth and the thermal effect that passes through the metallic substance.

There are many theories in regard to the permeability of zinc oxyphosphate. Zinc oxychlorid is not as porous as gold, as in cutting out a zinc oxychlorid filling you must realize the difference in hardness and lack of permeability that exists between these two substances; that alone proves the correctness of the clinical observation of Dr. Head in regard to the permeability of the oxyphosphates.

Dr. HEAD. Dr. Ottolengui, will you re-state the question so that I can understand it?

Dr. OTTOLENGUI. I have understood that those who favor cementing joints claim that the cement prevents recurrence of caries—why, we have not been decid-

edly told. If that be true in inlays, where the cement comes completely to the surface, and if, in the hands of good operators, caries has recurred around fillings where there is no cement, because it has reached that invisible margin, the gold and enamel, and if it be true that cementing stops it, I want to know what you gain by having cement under the filling when you are going to wipe off the very part you want to save—the enamel.

Dr. HEAD. I am very glad to answer that to the best of my ability. Cement saves the tooth in the same way that gold saves it. Cement filling saves it by excluding the decay-forming bacteria from the substance of the tooth; and that, I think, is the way any filling will save a tooth. They may work by different methods, but that is the object, and that is what they are made for. Now, if we had a gold filling that absolutely adhered everywhere to the enamel wall, or to the cavity wall, we would have, in my opinion, a gold filling that would be as perfect in saving the teeth as the cement. There are in the hammered gold fillings always some air-spaces between the gold and the tooth-structure; but these air-spaces, unlike those in cement, do not effectively discourage bacterial growth. These spaces are sufficiently large to allow for the entrance of not only one or two bacteria, but a colony of them sufficiently numerous to cause decay.

Dr. OTTOLENGUI. Do you mean the bacteria go through the metal, or between the metal and the tooth?

Dr. HEAD. Between the metal and the tooth; not only in the gold, but also between the gold and the enamel. If there are imperfections in the gold, there will also in all probability be imperfections between the gold and the tooth, and the latter are the dangerous ones. It is of those spaces that I speak.

If the gold were to seal the cavity perfectly it would be as good as cement, but we know that it does not.

If the gold filling is hammered in the ordinary way—and we will grant for the sake of argument that you may get

a perfect seal on the edge—what will be the result? We all know there is a certain rate of wear to every gold filling. There is also a certain rate of wear to tooth-substance. While there may be a perfect edge for one or two years, eventually an air-space will appear leading to the floor of the cavity. When the cement protects the edge, or reaches up to a short distance from it, we have an absolutely adhesive gold filling, and one which will preserve the tooth.

If you have cleaned off the enamel margin, and have had a space of a thirty-second of an inch to build up with gold, you can feel that the dentin is fully protected by the cement. A gold filling lined with cement that makes it adhesive from top to bottom is, I think, a filling that—barring fracture—will be good as long as the tooth remains in its socket.

Dr. OTTOLENGUI. Mr. President, I just want to make my meaning plain. I am not talking of gold fillings. I believe a gold filling can be put in without any cement. In other words, I wanted to know why you put that cement there for protection.

Dr. J. H. HANNING. The members this evening are talking about cement margins. I believe the cement preserves the tooth because it is more compatible with tooth-structure. I do not at all agree with Dr. Ottolengui that the all-gold filling will preserve a tooth best.

Dr. OTTOLENGUI. I said a gold filling with cement that does not come over to the margin.

Dr. HANNING. There I agree with you. The best gold operators meet with recurrence of decay at times. I believe cement is the best tooth-preservative.

Every man who has spoken about cement on the margins and all that sort of thing, has said that the smaller the amount of cement exposed in the joint of any kind of filling, the less liability there is to recurrence of decay. Then why not use a good bulk of cement to protect the tooth from thermal shocks, and then have the metal filling so placed that the tooth will not disintegrate, and the margins as perfect as possible without the exposure of cement.

I think a good many men will not acknowledge, even to themselves, that the metal has really caused more recurrence of decay under gold fillings than anything else. They are so afraid they will not get the specific gravity. You would think they were trying to knock the tooth out. If they used softer gold and hand pressure it would be better.

Very many of these old fillings were not inserted with the aid of the mallet at all. They were put in by hand; the tooth was not pounded to pieces. I do not believe it is necessary to use the mallet. Fillings fail because the margin is simply battered, knocked all to pieces.

Dr. BROOMELL. I would like to take exception to Dr. Head's idea that the bacteria find their way through porous gold fillings.

Dr. HEAD. I never said that.

Dr. BROOMELL. I so understood Dr. Head's remark. He would have us believe that the porosity of a gold filling, or the lack of condensation, is responsible for the recurrence of decay simply because the bacteria enter these small crevices in the filling.

I am not of the opinion that the bacteria, in recurrence of decay, necessarily have to enter the tooth in any way whatever. I think they may be under the filling in a latent condition, and we all know that all that is necessary to make them active is heat and moisture; and if there is a leak in the filling, so that a sufficient amount of moisture can enter—we already have the heat—we will have recurrence of decay through the renewed activity of the bacteria.

The question of enamel rods has been touched upon, and the possibility of their breaking down under certain stress and strain has been mentioned.

I have never been very much of a believer in this careful consideration of the direction of the enamel rods in the preparation of a cavity. If it were possible to establish in our minds just what direction these rods took in every case, we might then proceed to prepare the cavity under certain definite rules.

Of course, we know that in certain exposed surfaces, like the labial surfaces

of incisor teeth, they do take definite direction; but when we come to the complex teeth—the canines—on the occlusal surface as well as on the approximal surfaces, the direction of the enamel rods is so very complex that it is simply impossible in the preparation of a cavity to take them into consideration. I believe, as the last speaker said, that the greatest damage results through the hammering and breaking down of the enamel rods, rather than through any subsequent strain placed upon them.

The PRESIDENT. Has Dr. Capon anything to add?

Dr. W. A. CAPON. Only just to apologize for not quite understanding the subject. I thought it was cemented inlays we were talking about. I did not know it was what we called combination fillings, which have been in use for a great many years; otherwise I might have made the discussion cover considerably more ground, because I have had a great deal of experience in using gold and alloy in the form of cemented fillings. I understood the subject was cemented fillings from the porcelain and gold standpoint, and it is in this light that my discussion must be considered.

Dr. HEAD. Dr. Broomell thinks I said that bacteria which get into the gold filling could cause decay in that filling. I said that, the filling having air-spaces throughout it, bacteria could leak in. They could not possibly harm the substance of the gold, but would travel between the gold and the tooth-substance, and eventually cause caries.

Dr. Broomell made a statement tonight which surprised me. He said it was not only the bacteria getting into the cavity that might cause decay, but the living bacteria that were left in the tooth-substance after the filling was inserted.

Dr. BROOMELL. I tried to say that there frequently remained in a tooth, after filling it, certain bacteria, which were simply lying there waiting for moisture to bring them again to activity.

Dr. HEAD. Even when they are killed with pure carbolic acid?

Dr. BROOMELL. Well, are you sure you have killed them?

Dr. HEAD. The point is this: It depends entirely upon how Dr. Broomell prepares the cavity. I prepare and cut away sufficiently to know that there are practically no bacteria left within, and as regards the heat and moisture, you always find that in a tooth. A tooth is porous; how are you going to keep moisture away? Is it not a question of food supply? Under the circumstances, if the bacteria are there, why don't they start up at once? Under what conditions is there going to be more heat and moisture than there is already?

If you prepare your cavities properly there will not be any dangerous amount of bacteria left inside; these should be sterilized.

Dr. BROOMELL. They are in the pulp.

Dr. HEAD. Then devitalize the pulp. An admission that enough bacteria are left to cause decay is in my opinion an admission that the work is not thorough. When the tooth is developed, and the apical foramen is completed, the pulp is of very little importance in comparison to the knowledge that you have a thoroughly aseptic condition within.

Dr. OTTOLENGUI. May I ask a question? Do you ever fill a tooth the same day you prepare the cavity?

Dr. HEAD. Certainly I do.

Dr. OTTOLENGUI. Then you leave some bacteria.

Dr. HEAD. I am sure of the cleanliness inside, and I am sure I do not leave infection there.

Dr. OTTOLENGUI. You are sure of a macroscopical cleanliness, and not microscopical cleanliness.

Dr. HEAD. I feel sure I have killed them; or if not, I have sent them to sleep so they won't wake for a long time.

Dr. OTTOLENGUI. Dr. Miller proves that they live twenty-four hours in carbolic acid.

Dr. W. W. Walker moved a hearty vote of thanks to Drs. Broomell, Capon, and Head for their very interesting presentation of the subject.

The motion was unanimously carried. Adjournment.

WM. B. DUNNING, D.D.S.,

Editor N. Y. Odont. Soc.

REPORT OF THE SAN FRANCISCO DENTAL RELIEF COMMITTEE.

TO THE NATIONAL DENTAL ASSOCIATION, AND TO THE DENTISTS, DENTAL SUPPLY DEALERS, AND OTHERS WHO CONTRIBUTED TO THE RELIEF OF THE STRICKEN DENTISTS OF CALIFORNIA:

Dear Friends,—On April 18, 1906, the city of San Francisco was overwhelmed with the greatest double disaster of earthquake and fire that has ever been visited upon any city in the history of the world, and which resulted in the death of several hundred persons and in a property loss of over \$300,000,000.

Our profession was severely afflicted by this catastrophe, two deaths having been recorded as the direct result of the earthquake—Dr. C. L. McPike of San Francisco and Dr. Warren DeCrow of San José, and out of 559 dental practitioners in San Francisco over 500 were burned out, losing their entire professional outfits, and many of their homes as well.

The days of the earthquake and the fire and those immediately following were dark days indeed to the people of San Francisco, but the energy and dispatch with which the entire country responded so generously to our cry for help will never be forgotten by our then crushed and destitute people. Provisions, clothing, and money came pouring into the city, while the flames were still devouring the business property and the homes of our citizens; and but for this timely assistance the suffering from the pangs of hunger and cold would have been much greater than they were. Destitution at this time was so great that many of our own profession were by their necessities compelled to enter the "bread line," while others were forced to live for several days and weeks in the "refugee camps."

Our people were, however, possessed

with a superb courage which arose above the depressing influences of their surroundings, and they soon began to plan for the rebuilding of the city and rehabilitating their business.

The members of our own profession were at first greatly discouraged over the prospects of re-establishing their practice, as their *clientèle* was scattered to the four winds of the earth. More than 250,000 people left the city during the first week following the disaster, which made the prospects of earning a living along professional lines look very dubious indeed. As a result of this, many dentists abandoned their profession and went to work at anything that would furnish a sufficient income to keep the wolf of want from the door. Some even became day laborers, shipping clerks, teamsters, etc.

It was not necessary for the dentists of San Francisco to send out a special plea for help, from the fact that before they had time to think of asking for such assistance money began coming in by telegraph, being sent to the undersigned committee, which was appointed by the Chicago dentists and dealers, and afterward ratified by the dentists of other cities and by the Executive Council of the National Dental Association.

The committee began its relief work immediately after the receipt of the first donation, \$2000, which came forth from Chicago, and reached us on April 25th. Notices were placed in the newspapers stating that a Dentists' Relief Committee had been appointed and that money was being forwarded from the dentists and dealers of the country for the relief of members of the profession, dealers, and their employees, who were in need of financial assistance. At the second meeting of the committee it was resolved that, inasmuch as nearly every dentist

in San Francisco had suffered considerable loss by the disaster and that many of them were left entirely destitute, the sum given to each member would of necessity have to be small, as we had no idea how much would be contributed by the profession for this purpose. It was therefore decided that we would not be justified at this stage of our work in giving to any individual a larger sum than \$20, except in urgent cases of need caused by sickness, death, etc., and that as far as possible this money be given for instruments with which the recipient could begin to do a little practice. At this stage of our work the dental dealers of San Francisco agreed to accept our order of twenty dollars upon them for instruments at a face value of \$27; in other words, they agreed to sell \$27 worth of instruments for \$20, which was practically wholesale price. Later, when more money had been received, we sent out word that a second sum of \$20 was available for such as needed further relief. Many never applied for second relief, hence a surplus was left in our hands to be disposed of.

For a time your committee held weekly meetings, later bi-weekly, and then, as the demands upon their time became less, they met but once each month. For the last four months there have been practically no requests for assistance, and the work of the committee would have been closed soon after the beginning of the new year but for the illness of the chairman.

On April 13, 1907, the committee met for the last time, and after auditing the accounts of the treasurer, ordered his report to be printed in the dental journals, a copy of the complete report to be forwarded to each of them with a request that it be printed in the June issue of the journal.

The following preamble and resolution was then passed by a unanimous vote of the members of the committee present at the meeting:

Whereas, There is left in the hands of the San Francisco Dental Relief Committee the sum of \$3969.75 after having discharged our duties to the best of our ability in relieving

the distress of the dental profession caused by the April disaster, and there being no further urgent need for the money in connection with the relief work; therefore be it

RESOLVED, That the balance of the money now in our hands be turned over to the National Dental Association, to be used as a nucleus for a National Relief Fund, the same to be invested in securities which can be quickly realized upon in case of necessity; the interest of which may be employed for the use of worthy superannuated dentists, and the principal available for the relief of dentists who may suffer from any calamity, such as flood, earthquake, or fire.

Appended hereto is the report of the treasurer. From this report it will be seen that the only expenses incurred by the committee were for necessary clerical help, newspaper advertising, printing, stationery, and postage.

In passing the preceding resolution, which establishes a fund for worthy superannuated dentists, it is earnestly hoped that the profession will become interested in increasing the fund until it shall reach a sum of not less than \$50,000. No more worthy object can engage the attention of the profession than that of providing for the worthy members of our profession who, by misfortune coming to themselves or others in their declining years, are cast upon the charity of a sometimes cold and unfeeling world.

TREASURER'S REPORT.

Receipts.

April 1906.

28th. Chicago dentists and dealers \$2,000.00

May.

12th. Chicago dentists and dealers	1,000.00
16th. Mrs. C. L. Goddard, Berkley, Cal.	100.00
23d. Fourth International Dental Congress	750.00
28th. <i>Items of Interest</i> fund.....	3,450.00
28th. National Dental Relief Committee (J. D. Patterson, Treas.)	550.00
28th. Dr. F. M. MacDonald.....	12.00
31st. National Dental Relief Committee	225.00
31st. <i>Items of Interest</i> fund.....	1,200.00
31st. North Carolina Dental Association	255.00

June.

10th. Denver, Colo., dentists.....	\$250.00
19th. Los Angeles, Cal., dentists..	300.00
19th. Boston, Mass., dentists.....	1,000.00
19th. National Dental Relief Com- mittee	780.00
19th. Dr. Jas. McManus, Hartford, Conn.	10.00
19th. Columbus, Ohio, dentists....	100.00
27th. National Dental Relief Com- mittee	240.00

July.

2d. Georgia State Dental Asso- ciation	100.00
10th. Dental Cosmos fund.....	600.00
10th. The S. S. White Dental Mfg. Co.	1,000.00
11th. Portland, Ore., dentists.....	500.00

August.

2d. National Dental Relief Com- mittee	42.75
5th. National Dental Relief Com- mittee	72.00

September.

9th. National Dental Relief Com- mittee	\$31.70
20th. Colorado State Dental Asso- ciation	140.00

December.

30th. Chicago dentists and dealers	500.00
	<u>\$15,208.45</u>

Disbursements.

[Relief orders, itemized in report, are here given
in total.]

RELIEF ORDERS	\$10,759.50
Printing	\$24.25
Newspaper announcements.	65.40
Mimeograph work.....	19.25
Postage	22.75
Clerical service.....	315.00
Freight on second-hand chairs from Boston.....	32.55
	<u>479.20</u>
	<u>\$11,238.70</u>
Balance on hand April 13, 1907..	3,969.75
	<u>\$15,208.45</u>

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THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JUNE 1907.

EDITORIAL DEPARTMENT:

CONCERNING DENTAL LIBRARIES.

WE note with much satisfaction the growing interest manifested in various directions in the creation of dental libraries by the dental profession itself. An interest among dentists in the literature of dentistry is of comparatively recent origin. It is true that several notable private collections of dental literature have been made by individuals, *e.g.* the collection of the late Dr. H. J. McKellops, now in possession of the Dental Department of Washington University; those of Dr. A. L. Northrop of New York, of Dr. W. H. Trueman of Philadelphia, of Dr. S. A. Freeman of Buffalo, of John E. Grevers of Amsterdam, of A. Sternfeld of Munich, and a few others. Some dental societies and a number of dental colleges have also created dental libraries, and a few of the great national libraries—for example, La Bibliothèque Nationale, Paris, and the library of the Surgeon-general's Office, Washington, D. C.—contain important collections of dental publications. On the whole, however, the general interest among dentists in the

literature of their profession has been limited, and the average dentist apparently confines his professional reading to a few current periodicals.

In the February issue of the DENTAL COSMOS we published an announcement of the creation of a dental library in Columbus, Ohio, in connection with the new Carnegie Library of that city, and the formation of a dental library committee acting under the auspices of the Ohio State Dental Society, charged with the duty of promoting an interest in the dental library and of securing funds and contributions of books and other literature toward the enlarging of the library collection. The central location of the library will make it accessible to dentists throughout the state, and the enthusiastic interest and energy of its promoters argue favorably in respect to the successful fulfilment of their purpose.

During the latter part of April just passed a similar movement has been inaugurated in Springfield, Mass. The City Library Committee of Springfield has invited the local dentists and physicians to join in the formation of a medical and dental library as a part of the City Library plan and under its auspices. The movement has been received with enthusiasm by the dentists of Springfield, and under the guidance of the well-selected committee promises to bear practical fruit.

The growing interest in dental literature which these movements manifest is encouraging because it gives practical evidence of a new stage of development in our professional work. The criticism has often been made—and too often it has been warranted—that the dental profession was not a reading profession: that dentists as a class were not so familiar as they should be with the literature of their calling. That in very many instances this criticism has its foundation in fact is evident from the constant repetition of ideas in all departments of our work which are recorded and re-recorded throughout our literature. Anyone who has kept in touch with the records of dentistry can testify to the chronic habit which certain ideas seem to possess of being born again with each new generation of dentists—indeed, often with each set of graduating classes that annually go out from our colleges. This would be less likely to occur if the originators of these ideas were to familiarize themselves with the records of the

past, to discover the existing state of the art—as, for example, the inventor of a presumably patentable device is compelled to do when seeking to secure government protection of his rights to his invention. It is not presumed that it is necessary, even were it possible, that a man should know all that has been recorded in the lines of his professional work; but it is presumed that no man is warranted in rushing into print with an idea that has been published many times previously and with which a considerable number of his colleagues are already familiar. It is this unfortunate tendency that gives rise to the common complaint that our journals and text-books are filled with a rehash of old ideas—a complaint that would be without foundation if writers would study the literature of their topics before publishing.

Medicine has grown past the stage where such criticism is generally applicable to its publications, at least in any like degree, and the reason is not far to seek: First, the reading habit among physicians is more generally developed, owing to the greater age of medicine as a profession, the greater competition, and the more important vital issues with which medicine has to deal—all of which compel a closer attention to the steps of medical progress by those enlisted in the work. Secondly, the demand for access to the sources of medical literature has stimulated the growth of medical libraries, and these repositories of medical literature are to be found in all the large centers of population; and hence it is that it is a common and accepted characteristic of medical writers to manifest a familiarity with the work of collateral writers, which as a general thing is conspicuous in dental writings by its absence. The failure to refer to the bibliography of a subject is a common fault of dental writers, and one which should be corrected—not only because a lack of knowledge of previous contributions on a given subject is the essential reason why we are loaded down with a useless repetition of records, but also because it is a fruitful source of misunderstandings and much polemical controversy as to priority and originality which could be easily avoided.

As a first step toward the correction of these difficulties and a radical improvement in our literature, the establishment of dental libraries, repositories of our literature easily accessible to our profession, is pre-eminently necessary. The creation of a

dental library is not the work of a day, but of years, and it can only be done when actively supported by the unremitting interest and enthusiasm of those concerned; and by "those concerned", let it be understood, is meant the whole dental profession. The material is not lacking, but what is needed is that wherever and whenever a movement toward the creation of a dental library is initiated, that fact should appeal to every dentist accessible to such a center, and he should regard it as his individual duty to further the work. Every practitioner accumulates quantities of books and periodicals that would be doing better service both to himself and his colleagues if they were gathered together in connection with other such collections and arranged and classified under the methodical and accessible plans of a well-managed library. Files of periodicals could in this way be easily completed and kept so that they could be consulted for reference or studied by all interested; whereas under ordinary circumstances they too often find their way to the furnace or waste-paper heap and are thus totally lost.

We commend the dental library question to the serious consideration of the dental profession as a whole. It is high time that we had a representative and complete dental library at our national capital, and as many local libraries as can be created. With a view to the further promotion of this object, and as an important initial step in bringing about a closer relationship among those interested in the making of dental libraries, the Editor of the DENTAL COSMOS invites all who have this work at heart to inform him as to what collections they have thus far made or may have in view, the purpose being to publish later a list of dental library workers so that an arrangement for mutual helpfulness in the way of exchanges, etc., can be brought about.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*Revue Odontologique*, Paris, March 1907.]

RECURRENT BULLOUS STOMATITIS. By
DR. LEBEDINSKY, PROFESSOR AT THE ÉCOLE
DENTAIRE DE FRANCE, PARIS.

The patient, a man aged twenty-six, consulted Dr. Lebedinsky during May 1905 with regard to the condition of his mouth. The clinical history of his family is bad, as both his father and mother had never enjoyed perfect health. The patient's own clinical history shows that he had suffered from frequent attacks of bronchitis since the age of two years, and also from attacks of measles and whooping-cough. He was pale, nervous, and emotional. At the age of fourteen his health was again greatly impaired by the presence within the alimentary canal of the oxyuris vermicularis, and at fifteen he had an hemoptysis. He was at once taken to the country and there, after a few months of careful dieting and nursing, recovered his health, gaining in weight considerably. Shortly afterward, while still in the country, he suffered from an attack of stomatitis—diagnosed as herpetic—which lasted eight days. Since then similar attacks have recurred at least three times a year, and have assumed the character of well-defined hydroa generalized upon the lips, internal surfaces of the cheek, palate, floor of the mouth, lateral margins of the tongue, soft palate, anterior and posterior pillars of the fauces, pharynx down to the beginning of the esophagus, and margins of the gums. The attacks of stomatitis occurred almost concomitantly with the appearance of erythematous bullæ on the hands, forearms, feet, and lower limbs.

According to the patient's own statements, the slightest degree of overwork or fatigue is followed by the appearance of one or more bullæ and by edema of the upper or lower lip. The bullæ gradually dry up, and in about ten days the areas upon which they had de-

veloped become filled with granulation tissue. At such periods his health status is usually far below par, and the slightest physical or mental effort gives rise to malaise, slight fever, and pain in the lumbar region. Besides, the oral mucous membrane in certain spots assumes a deep red color, is apparently thicker, and upon the following day bullæ of about the size of an ordinary pinhead appear on the inflamed spots on the lips, hands, and feet. During three days the bullæ in the mouth multiply and increase in size; the mouth itself is sensitive, the tongue coated, the lips swollen, and the general sick feeling continues. On the fourth day the bullæ begin to suppurate and then to ulcerate, the gums around the teeth become red, and likewise ulcerate. The ulcers, which gradually increase in size, have irregular borders, and are covered by an adherent yellowish-white pultaceous layer of ulcero-membranous appearance, the removal of which exposes a mucous surface of a very deep red color and induces bleeding at the border of the ulcer. A secondary pultaceous layer appears soon afterward. In the meantime, the mouth is painful and there is hypersalivation from the submaxillary glands, painful mastication, general indisposition accentuated through auto-intoxication, pain in the lumbar region, slight fever, and conjunctivitis.

Until about the tenth day the spreading of the ulcerative process continues, the whole mouth and the submaxillary glands becoming involved. The mouth cannot be closed, the lips are ulcerated, sleep is disturbed, and the patient is unable to take solid food. On the eleventh day the tumefaction begins to decrease, the borders of the ulcerations assume a redder color, the pultaceous covering becomes sprinkled with reddish spots, and healing begins. In about four days the tissues practically regain their normal appearance. The bullæ on the extremities, which

at first are of the size of an ordinary pin-head, may attain to one-half cm. in diameter, and are surrounded by large red aureolæ. After reaching such a size they become flattened and the center of the bullæ—seen through the epidermis—presents a granular appearance. They are sensitive, but do not suppurate. While the mouth ulcerations are healing, the bullæ of the extremities dry up, the epidermis is exfoliated, and very soon healing is complete. As treatment of this condition by means of medicinal agents is of little or no avail, it should be directed principally toward the relief of the more annoying symptoms, such as pain on eating, which may be greatly decreased by painting the mucous membrane of the mouth with an oily solution of cocain. The patient's diet should be exclusively liquid, *i.e.* bouillon, beaten raw eggs, vegetable soups, etc. In the last attack, intra-muscular injections of sodium cacodylate in the proportion of 0.05 gm. to 1 ccm. *per diem*, and four orchitic granules (Bula), containing each 0.10 gm. of the dry principle, greatly mitigated the severity of the symptoms.

[*La Odontologia*, Madrid, March 1907.]

THE PREVENTION OF RUSTING BY MEANS OF GUM-RESIN EUPHORBIIUM.

According to the *Revue Internationale de Prothèse Dentaire*, it has been found in the course of certain works undertaken by the government of Natal that the steel and iron tools used in cutting down certain plants of the family of the euphorbiaceæ would become coated with a very adherent layer of gum-resin, and would not rust afterward. Following those observations further experiments were carried on, with the view of determining whether the gum-resin euphorbium could be utilized as a preventive of rust. Iron plates were covered with a thin layer of the gum-resin and submerged in sea-water, and after allowing them to remain there for some time were removed, and it was found that no disintegration whatever of the surface of the plates had taken place. It was then considered advisable to work out a method by means of which the hulls of ships, and all metals exposed to the same powerful disintegrating influence, might be efficiently protected. For this purpose a solution of the gum-resin in alcohol was prepared. This

solution, upon being applied to a metallic surface, and after evaporation of the alcohol, leaves the surface coated with a thin residue of the gum. Since the conclusion of these experiments steel plates treated in the above described manner—after remaining immersed in the ocean for two years—did not show the slightest sign of alteration of their surfaces.

[*Revue générale de l'Art Dentaire*, January 1907.]

THREE CASES OF SEVERE INFECTION OF DENTAL ORIGIN. BY M. DUBOIS, CHIEF OF CLINIC AT THE ÉCOLE ODONTO-TECHNIQUE, PARIS, FRANCE.

The first case described by M. Dubois was that of a young cavalryman under treatment for incipient pulmonary tuberculosis, at the military hospital of Melun. Under careful dieting and general medical treatment his condition improved markedly until, following the extraction of a painful lower molar, the third molar on the same side became the seat of excruciating pain, owing to an intense pericemental infection, doubtless caused by the carious condition of the crown of the tooth. This was shortly afterward followed by a voluminous swelling at the mandibular angle, and by trismus so intense that it became absolutely impossible to even force the mouth open. His general condition became very bad, and his temperature stood far above the normal.

The patient was anesthetized with chloroform, and when complete relaxation had set in, the mouth was prized open. It was then found that the anterior pillar of the fauces and the soft palate on the affected side were highly edematous. The phlegmon was then opened and an incision was made at the mandibular angle, from which a considerable amount of pus was discharged. The effects of this first intervention were favorable, as his general condition improved, and the mandibular trismus diminished. The third molar, which was extracted at this time, was found badly decayed, and the root-canals and pericementum in a state of severe infection. The improvement lasted only four days, when the fever and trismus reappeared, the latter symptoms showing recurrence of the myelitis. He became gradually weaker, his weight continually decreased, all this notwithstanding that the wounds—both external and in-

ternal—seemed in good condition, and he died three weeks afterward. There is no doubt that death in this case was due to septicemia from the carious third molar, and that if this tooth had been extracted at the proper time, death might have been prevented.

The second case was that of a young woman who presented a number of buccal fistulæ, traceable to an impacted third molar. The tooth was removed under chloroform anesthesia, but as the fistulæ had existed during at least two months prior to the extraction, her general condition had been so severely undermined that she contracted tuberculosis, and her condition at the present time is most serious.

The third case was that of a tuberculous man, whose death was doubtless hastened by an attack of tuberculous stomatitis following upon an attack of ulcero-membranous stomatitis, brought about by an infection of the oral tissues which had spread from an inflamed and infected socket of an incarcerated third molar.

[*British Dental Journal*, London, April 1, 1907.]

SPURIOUS HEMOPTYSIS. BY PEVEREL S. HICHENS, M.D., M.R.C.P.

In the course of a lecture upon the treatment of hemoptysis, given before the South Midland Branch of the British Medical Association, Dr. Hichens said that practitioners are frequently confronted by patients in whom the blood-spitting of which they complain does not come from the lungs, bronchi, or trachea. Blood-spitting is almost indissolubly associated in the public mind with phthisis, and hence its occurrence, even in the mildest form, is generally sufficient to make the patient hasten at once to a physician, fully prepared to hear that he has consumption.

One kind of cases of so-called hemoptysis occurs not infrequently in anemic and rather neurotic women. They are brought to the physician by their mothers, and complain that they wake up every morning with a taste of blood in their mouth, or with the mouth full of blood, or that the pillow is found every morning to be stained with blood. On investigation it is found that there are no abnormal physical signs in the lungs; that the patient has usually the ordinary symptoms

and appearance of anemia; that the gums are pale and inclined to recede from the teeth; that the teeth are carious and ill kept, and that there is frequently a certain amount of pyorrhea alveolaris. The blood-spitting turns out to be saliva tinged pink by oozing of blood from the gums. Such cases are easily cured by astringent and antiseptic mouth-washes, by better care of the teeth, and by the ordinary treatment for anemia.

[*Dental Surgeon*, London, March 30, 1907.]
INJECTIONS OF FRESH SERUM IN HEMORRHAGIC CONDITIONS. BY DR. M. P. EMILE-WEIL, PARIS, FRANCE.

At a meeting of the Société Médicale des Hôpitaux, of Paris, on January 11, Dr. M. P. Emile-Weil (*Lancet*) read an important paper on the "Treatment of Hemorrhagic Conditions with Fresh Blood Serums." Physiologists have shown the favorable action of calcium salts on the coagulation of blood, and Sir A. E. Wright has pointed out their value in the treatment of hemorrhagic conditions. Physiologists have also shown *in vitro* that incoagulable blood recovers its coagulability on the addition of fresh serums, but, curiously, the hemostatic value of such serums in man has never been tested. Dr. Emile-Weil has found that *in vitro* the addition of fresh serum completely corrects the various defects of coagulation of the blood of hemophiliacs. The same effect is produced *in vivo* by injections of serum, and the patient whose blood has become normal comports himself as a normal person. In one case a tooth was extracted twenty-five days after the injection of serum without notable hemorrhage, and in another case the operation for empyema and incision of a perinephritic abscess were performed without any remarkable hemorrhage two days after the injection of 20 ccm. of fresh horse serum. In a third case, a patient who had had hemarthroses every month ceased to suffer for eleven weeks. In a fourth case, hematuria which had lasted for a month diminished, and ceased in three days. In purpura, whether primary or secondary, acute or chronic, excellent results were also obtained.

A woman of fifty-one, addicted to alcohol, was admitted to the hospital on September 19, 1905, with febrile polyarthritis. Her gums were fungating and bleeding, and there

was epistaxis. On the 23d subconjunctival hemorrhages, large purpuric spots on the limbs, and intense hematuria appeared. An intravenous injection of 15 ccm. of ox serum was followed by remarkable improvement. On the following day the temperature fell from 102.2° to 99.5° F.; the urine was almost clear, the gums were no longer fungating or bleeding, and the arthritis had disappeared.

In another case instanced a man had been suffering for three days from intense hematuria, the urine consisting of almost pure blood. There were also purpura, in the form of large ecchymoses, melæna, and fungating and bleeding gums. The temperature was 102° F. This state was a sequel of typhoid fever, complicated by double pneumonia. The urine contained innumerable pneumococci. The blood showed delayed coagulation and want of retraction of the clot. Thirty ccm. of anti-diphtheric serum two days old were injected under the skin. On the following day the gums no longer bled and were not fungating, and the renal hemorrhage had much diminished. On the next day there was not a trace of albumin or blood in the urine, and the temperature was 99.3° F.

The following is an example of the results obtained in chronic purpura: A man aged forty-two, addicted to alcohol, had a large liver, articular pains, and purpura of the legs and arms. During three months ten eruptions of purpura occurred, and the articular pains alternated with abdominal crises. The urine constantly contained blood, and there was prolonged hemorrhage whenever the patient cut himself in shaving. Fifteen ccm. of ox serum were injected on July 22d, and the hematuria, purpura, and pains disappeared.

Dr. Emile-Weil concluded that fresh serum is an effective remedy for the arrest of hemorrhages in all dyscrasic states—more effective than any other, including calcium salts. He recommended the following technique: For dyscrasic hemorrhages in adults 15 ccm. of fresh serum should be injected into the veins, or 30 ccm. under the skin. A second injection may be given without ill effects two days later. In children half-doses may be given. The serums of man, the rabbit, the horse, or the ox are equally efficacious, but *in vitro* human serum has a more

marked effect on defective coagulation. The serum should not be more than a fortnight old. Ox serum, though very active, should not be used. It was the only serum which produced ill effects. These occurred immediately after injection, and were always fugitive, but sometimes marked. They consisted of considerable rise of temperature, rigors, cyanosis, vomiting, headache, and backache. In hospitals human serum is generally available; in private practice rabbit serum may be easily obtained by antiseptic bleeding from the carotid artery. Anti-diphtheric serum may be used, but simple serum is preferable.

[*Odontologische Blätter*, Berlin, March 1907.]
CARCINOMA OF THE MOUTH. BY FRANZ THOMAS, BRESLAU, PRUSSIA.

The etiology of cancer unfortunately remains as yet in the dark, there being so far nothing definite to show that it is of parasitic origin, or that the evolution of this class of tumors is the result of chronic mechanic or chemic irritation, or of the development of dormant epithelial debris. The evolution of cancer can best be studied in the mouth. As the result of a chronic irritation, the disturbance designated as leucoplakia appears on the mucous membrane of the lips, tongue, and cheeks. It is observed mostly among users of strong tobacco and alcohol, and very rarely among women. Carious teeth, the gout, diseases of the stomach, and syphilis may give rise to leucoplakia. As leucoplakia and carcinoma are often found together, the question arises, Is leucoplakia in itself a definite disease or is it the antecedent of oral cancer? In the light of the investigations of Nedopil, Schwimmer, and Schuchardt, it is at the present time safe to assume that leucoplakia and carcinoma are closely allied diseases, and the observations of Professor Partsch and the essayist fully confirm this view. Carcinoma of the floor of the mouth is but seldom mentioned in the literature of cancer, for the author, apart from the cases recorded by Escher and Horber, has been able to collect but fourteen cases, all of which were operated upon by Professor Partsch. Out of this series of fourteen cases, in seven (fifty per cent.) white plaques were found near or beside the

carcinomatous growths. In these the plaques were traced exclusively to smoking in six cases, and to both smoking and mercurial treatment for syphilis in one. The seven cases of leucoplakia preceding cancer were in men, and in one the carcinomatous degeneration was directly traceable to the leucoplakia. In the latter case, one year after the leucoplakia had yielded to treatment with hydrogen dioxid, a tumor began to develop between two white patches, which upon microscopical examination was found to be a cancerous growth. In another case, several isolated cancerous growths were observed, each growing out of a leucoplakial speck. In still another case, of highly malignant nature, the growth sprang from a leucoplakial patch, the latter disturbance being doubtless of syphilitic origin. In view of the foregoing observations, Dr. Thomas is of the opinion that cancer of the mucous membrane of the mouth is but a malignant outcome of leucoplakia. Excluding the doubtful case, in which the cancerous tumor was perhaps the remote manifestation of syphilis, it will be seen that 42.86 per cent. of the cases observed by the essayist were directly traceable to leucoplakia—a percentage higher than that found by Schöngarth, who from a series of 277 cases of cancer of the mouth was able to connect but 61 cases with leucoplakia, which is 22.02 per cent. Leucoplakia should be treated from its inception with irrigations of potassium permanganate, sodium carbonate, and sodium chlorate solutions. If these agents should fail to eradicate the disturbance, in the majority of cases the thermo-cautery will prove more efficient.

Cancerous growth may find a potent predisposing cause in chronic irritations—such as may be induced by sharp margins of teeth—but whether it be indirectly caused by leucoplakia or through other sources of irritation, its clinical appearance remains unchanged. It begins as a small swelling, which soon undergoes ulceration. It does not at first disturb the patients in the least, and this is doubtless the reason why they fail to seek medical attendance until the disease has gained considerable ground. If the cauterization is not performed at once, ulceration proceeds rapidly. The breath assumes an offensive odor, and in the case of cancer of the floor of the mouth, the tongue

swells and both speech and mastication are greatly interfered with; still later on there is trismus of the temporo-mandibular articulation through infiltration and inflammation of the masseter muscle. In cancer of the cheek and of the floor of the mouth the maxillary bones are involved, thus causing the loosening and exfoliation of the teeth. Cancer of the oral structures is more likely to occur between the ages of sixty and seventy, and is seldom observed before the age of forty.

A wrong diagnosis is possible only in the beginning of the disease, for it may be at that period confounded with syphilis, tuberculosis, and particularly with actinomycosis.

The author in concluding refers to the differential diagnosis of the foregoing disturbances and to the surgical treatment of oral cancer.

[*Sveizerische Vierteljahrsschrift für Zahnheilkunde*, Zurich, April 1906.]

ON THE VARIATIONS IN THE SIZE OF THE MAXILLARY SINUS. By M. O. SCHURCH, LANGNAU, SWITZERLAND.

The author finds that when the palate is high and narrow, the operation of opening into the maxillary sinus is rendered decidedly difficult, because the plate of bone which separates the sinus from the alveolar process is thick in cases of high narrow palate, and thin in cases of flat palate. Perforation of the maxillary sinus through the nose is likewise more difficult to accomplish in individuals having a high narrow palate than in those having a flat palate, on account of the unusual elevation of the floor of the sinus, which in some cases may be so high as to absolutely preclude the possibility of reaching it from the nose. As the variations in size of the maxillary sinus are in general due to pneumatic phenomena within the body of the maxilla and adjacent structures, it is easy to explain how comparatively large sinuses may be found in small crania, and *vice versa*. The author has also found that there is a relationship between the size of the frontal and sphenoidal sinuses and that of the maxillary sinus, and also between the weight of crania and the size of the sinus, inasmuch as large maxillary sinuses were almost invariably found in crania of high weight, and *vice versa*.

[*Revue de Stomatologie*, Paris, March 1907.]
**TIC OF THE MUSCLES OF MASTICATION
 APPEARING IN THE COURSE OF AN
 ALVEOLO-DENTAL PERIOSTITIS.** BY
 DRS. V. GALIPPE AND FERNAND LEVY.

The case reported by the authors was that of a young man aged twenty-seven, of good hereditary and collateral antecedents. At the age of eight he suffered from the first attack of tic, which was characterized by sudden contraction of the orbicularis palpebrarum of each side of the face and of the orbicularis oris, as well as by twitching movements of the left ear. Subsequently he experienced no other discomfort until 1906, when he suffered from a pericementitis of the upper right first bicuspid. As the result of this infection, the right masseter muscle began to contract to such a degree as to render extremely painful the temporo-mandibular articulation of the same side. Concomitantly the right ear began to twitch, and shortly afterward the masseter on the left side likewise became the seat of spasmodic contractions. The frequency of the contractions increased and decreased in accord with the stages of intensity of the pericementitis.

[*Therapeutic Gazette*, Philadelphia, February 15, 1907.]

**MAXILLARY SINUS EMPYEMA IN THE
 NEWBORN.** BY DRS. WEISSMANN AND
 FIOCRE.

This disease is not common among infants, according to Weissmann and Fiocre (*Ann. des Mal. de l'Oreille, etc.*, No. 9, 1906), who state that it is first shown by a swelling and redness of the suborbital region or the entire side of the face. Inside the mouth there is swelling of the gum or the roof of the mouth. Later there is exophthalmos and a fistula inside the mouth or on the cheek, water injected into which flows out of the nose, and in which a probe feels dead bone. Secretion may be excessive or slight, and may continue after cure.

Treatment must be operative, lavage being of no use. The sinus may be opened from the nose, mouth, or cheek, but in infants the first gives too little room, and the second involves the loss of the roots of all the permanent teeth, so only the external operation should

be used in infants. If there is a fistula the incision should include it, otherwise it should extend from the root of the ascending ramus of the maxilla along the inner third of the floor of the orbit. The bony wall below the orbit is raised, the flap being inside and above the infra-orbital foramen, and the sinus then freely opened and all dead bone removed. When the sinus is clean a large counter opening is made into the nasal cavity, and the external wound closed without drainage.

[*British Journal of Dental Science*, London, March 15, 1907.]

**FRACTURE OF THE LOWER JAW
 ACROSS THE NECK OF BOTH CON-
 DYLES.** BY P. S. BIRD, M.D., LEEDS, EN-
 GLAND.

The author reports the case of a woman aged twenty-nine years who, while looking down the shaft of a hand-power elevator, was struck on the back of the head by the elevator while it was being lowered, with the result that the chin was driven forcibly against the rail guard, causing a deep incised wound through the skin and the soft parts along the lower border of the mandible, also the fracture of the mandible across both condyles.

Treatment consisted in the application of a vulcanite Gunning splint and a leather head-band, to keep the jaws firmly applied to the splint. At the end of the fourth week consolidation had taken place.

[*Le Laboratoire*, Paris, March 24, 1907.]

**STERILIZATION OF ROOT-CANAL IN-
 STRUMENTS.** BY DR. FRITEAU, PROFES-
 SOR AT THE ÉCOLE DENTAIRE, PARIS.

All instruments—burs, explorers, broaches, etc.—intended for use in root-canals, should be invariably subjected to a process of thorough sterilization. The method employed by the author consists in inclosing the instruments in glass tubes of suitable lengths, the extremities of which are sealed by holding them over a Bunsen burner flame. Once the tubes are hermetically sealed, they are placed in the retort of a vulcanizer and left therein until after vulcanization of a plate, as thereby the instruments will have been subjected to a sterilizing temperature of about 300° F.

PERISCOPE.

Care of Nickel-plated Parts.—One of the best methods known for keeping bright the nickel work about the office is to wet a rag with a solution of sodium hyposulfite and wipe the article with it, drying with a soft towel and then rubbing with a piece of chamois.—*Exchange*.

For Canker Sore Mouth.—I have found the full strength aromatic sulfuric acid almost a specific for this condition. I prescribe internally—Tincture of ferric chlorid gr. v, potassium chlorate gr. iij, water $\frac{1}{2}$ ounce; every three hours in lemonade.—J. E. POWERS, *Tri-State Dental Journal*.

The Best Clasp for Partial Plates.—The best clasp for a partial lower vulcanite plate is made of 18-gage gold wire, doubled, but not close, fitted to the tooth on the buccal and lingual sides, and the ends turned at right angles and vulcanized to the plate.—L. P. HASKELL, *Dentist's Magazine*.

To Avoid Chopping Up Crystal Gold.—Place a mass of crystal gold relatively in position in the cavity, and over it a mat of foil to facilitate carrying the crystal accurately to place *en masse*. Using alternate layers of crystal gold and foil, thus combining the virtues of both, will not only facilitate the packing, but will save both time and gold.—W. V.-B. AMES, *Dental Review*.

Argyrol for Pus-Pockets.—After the removal of deposits syringe the pockets with warm water and inject freely a twenty per cent. solution of argyrol. This is a thorough, non-irritating disinfectant, and invariably prevents soreness following surgical treatment. It is the only drug I find necessary in the treatment of pyorrhea, aside from a good mouth-wash.—*Dental Review*.

Preservation of Cement.—The tendency of phosphoric acid to crystallize in a dry, warm atmosphere, and to absorb water in a humid atmosphere, is so great that it calls for much care in its handling during consumption. We should keep our liquid for daily use separate from the supply bottle, and the best way to keep it is in the tightly

stoppered S. S. W. office preparation bottle No. 6. Vaseline the joint, thus rendering it air-tight, and making removal of the cap always easy. The liquid may be easily removed by the use of an Ames dropper, made to keep in the bottle, and great care should be exercised not to get any liquid around the joint.—ROBERT HOMER WELSH, *Texas Dental Journal*.

Use of Silver Nitrate under Cement Fillings.—The placing of silver nitrate under cement, while not interfering with its adhesive qualities, at the same time retards or prevents future decay of tooth-structure; therefore I consider it advisable, wherever discoloration is not objectionable, to apply it before inserting the cement, the percentage of solution varying according to nearness of the pulp.—ROBERT HOMER WELSH, *Texas Dental Journal*.

Objection to Immediate Root-filling.—I do not believe that immediate filling of the root-canal should be attempted after removal of the pulp under pressure anesthesia, for the reason that the cocaine not only anesthetizes the pulp but also a considerable area of the soft tissues at and adjacent to the apical foramen, so that when filling the root there is no way of determining when the end has been reached, by reason of these tissues being temporarily devoid of sensation. If the operator uses a method and has the skill to fill roots to the end, he will find, if he fills immediately, that he is more than likely to carry the root-filling into the soft tissue beyond the apical foramen, thus causing the patient much discomfort and perhaps the loss of the tooth, from continued irritation.—A. J. COTTRELL, *Dental Brief*.

A Precaution Before Operating.—The use of alcohol before applying the rubber dam cannot be urged too strongly. Accumulations heavily laden with bacteria are found in the mouths of most patients, about the necks of the teeth at the gum margin. If the dam is applied without removing and destroying the germs in these accumulations, infection of the gum is very often the result, and many cases of pyorrhea might be traced to such

negligence. Alcohol should also be used to wipe the tooth off after the dam is applied, as the mucus provides an unclean surface over which to work, and I think hand instruments are less inclined to slip when used upon a tooth which is thoroughly cleansed of mucus and other accumulations found there. If you use the ligature to hold the rubber dam down, as most dentists do, you are almost sure to force some irritating substance beneath the gum; but if you do not use the ligature, the rubber holds very much more tenaciously to the tooth when previously cleansed with alcohol.—J. F. WALLACE, *Dental Brief*.

Comparative Value of Porcelain and Gold Inlays.—One of the chief advantages of the gold over the porcelain inlay is the fact that the matrix being left on the inlay, we have at the very outset a more perfect fit of the filling, and in addition to this, the gold being malleable may at the time of setting be burnished into perfect contact with the enamel margin, thus reducing the cement space to a microscopic line; so that in point of a tooth-saving agent the gold inlay is better than the porcelain. Another point of advantage is the edge strength of gold over porcelain, whereby even frail walls may be protected rather than cut away.—L. E. CUSTER, *Dental Summary*.

Root-canal Filling.—After pulp-removal under pressure anesthesia, I always leave a small quantity of mummifying paste—zinc oxid, alum, and thymol—at the extreme end of the canal, and then fill with gutta-percha points dipped in a saturated solution of thymol in oil of cinnamon. The cinnamon gradually evaporates, leaving a layer of thymol crystals lining the root-canal.—WILFRED E. GRIFFIN, *British Dental Journal*.

A Crown Whose Band Remains Invisible.—Prepare the root as for a Logan crown, and with a Walker-Younger trephine, of a size to suit the case, drill a groove one-sixteenth of an inch deep into its face well toward the lingual border. Now place in this groove a ring that corresponds in diameter to that of the trephine used, and grind it even with the face of the root. These rings are made of No. 30 gage gold or platinum, depending upon whether a porcelain or Richmond crown is to be used. A stock of the different sizes can be made and kept on hand. The trephines used most are The S. S. White Dental Mfg. Co.'s numbers 2, 3, and 4. Leaving the ring in position, you next select a piece of metal of the same thickness, and of a size sufficient to cover the en-

tire surface of the root. Burnish it to place, being careful to anneal it frequently. Now remove the ring, place it in position upon this disk, and solder the two parts together. Replace the ring in the groove, and burnish and trim the metal disk until it corresponds to the size and shape of the face of the root. Should you care to make a banded Logan, puncture the disk and ream out the root-canal to fit the pin, and proceed in the usual way, for either a solder case or for porcelain. If a Richmond or an all-porcelain crown is desired, puncture the metal covering the canal, ream it out, and fit an iridio-platinum pin; tack it in place with sticky wax, remove, and solder. Now you can proceed in the customary way.

It is good practice when using the regular Logan crown to insert a ring or band with quick-setting cement, and to grind it even with the face of the root; then set your crown as in other cases. This will prevent the root from splitting on account of undue lingual pressure.

The advantages of the method are—absence of irritation to the soft tissues, no metal visible, and universal application to all-porcelain crowns or to those of porcelain in combination with metal.—S. D. RUGGLES, *Dental Summary*.

General Rules for the Preparation of Cavities for Gold Inlays.—In the preparation of cavities for gold inlays we must ever keep in mind that the inlay must be retained primarily by the mechanical relation between tooth and inlay. This should be laid down as a basic principle, and can be accomplished only by a close study of the direction and amount of force to which the inlay will be subjected. No one set rule for cavity preparation will serve for all cases, but in many instances must be left to the best judgment of the operator. Since so many similar cavities occur, however, under similar conditions, a few general rules may be given which in the main would be safe to follow. In all classes of cavities the general form should be such that when the greatest stress of mastication is brought to bear upon the inlay, it will be met by sufficient mechanical resistance to prevent its dislodgment. When this form of cavity is secured, that stress will tend to more firmly lock the inlay in the tooth. The theory of extension for prevention must be observed, but since gold inlays are especially applicable to extensive cavities, this principle is *ipso facto* accomplished. In general, the cavity preparation should be much the same as for a gold filling—with

certain exceptions. All undercuts and perpendicular walls should be avoided, and the axial walls should form a slightly obtuse angle with the pulpal walls and the seat of the cavity. This does not necessitate the beveling of enamel margins, as the enamel rods at the margins will then be supported by sound dentin. In case the margin of a cavity is in close proximity to the summit of a cusp, it should be carried well beyond this point, to admit of a sufficient bulk of gold to withstand the stress likely to be brought upon it, and thus protect the enamel margin. This can be accomplished nicely by the use of suitable stones and sand-paper disks. In approximo-occlusal cavities, the occlusal portion of the cavity should be carried well over that surface of the tooth, to allow for a decided dovetailing into a strong portion of the tooth-structure. Too great stress cannot be laid upon occlusal retention of inlays. It is the only reliable retention in this class of cavities, and yet in many instances it is by some operators entirely overlooked. The angle formed by an approximo-occlusal margin should be well rounded by means of stones and sand-paper disks, as this is a point of the cavity margin liable to fracture under stress of mastication, if left unprotected. The angle of the step should be slightly rounded to facilitate the adaptation of the matrix. All the peripheral margins should be nicely polished with sharp burs, Arkansas stones, and fine disks, until a smooth, clean-cut outline is presented.—*Exchange*.

Method of Making a Gold Inlay.—First have a good separation; then prepare the cavity as its outline form suggests, making the seat of the cavity horizontal or slightly beveled, and slightly smaller than the marginal edge. This being completed, burnish platinum foil in the cavity, using 1/1000 or 1/2000, as you would for a porcelain inlay. After the platinum is well burnished in the cavity and over the margins, place the matrix on the tooth, just as you would for an alloy filling. See that the matrix is securely fastened to the tooth and properly contoured. Then proceed to pack gold by hand pressure, using just enough pressure to pack it well against the walls and margins of the cavity, until there is sufficient gold to fill the cavity. Any variety of slightly annealed gold may be used.

The next step is to remove the matrix from around the tooth, and with any instrument, such as a broken explorer, driven into the mass of gold by a blow or two from a hand mallet, you should be able, if the cav-

ity has been properly prepared, to remove the entire mass from it. Now paint the part of the filling that comes in contact with the walls, seat, and margins of the cavity with whiting mixed with alcohol, to prevent the gold from flowing on those parts. Next take this mass of gold to the soldering block, and place it on a few asbestos fibers to keep it in the desired position.

Now take 22-k. gold plate, cut in small pieces, place piece by piece on the filling, and apply heat until it flows into the gold, thus making it a solid mass. After this is done trim the margins and any overhanging gold with a small stone or a sand-paper disk; place it in the cavity, and proceed to finish the inlay in the same way as you would any gold filling, doing the final polishing after cementing it to place, or better yet, at some subsequent sitting.—W. C. SMITH, *Dental Brief*.

When Gold Boils.—Prof. Henri Moissan has been trying some interesting experiments in vaporizing gold in the electric furnace. He finds that it boils at 2400° C., and that one hundred to one hundred and fifty grains can be evaporated in two or three minutes. By condensing the gold vapor on a cool surface, either filiform masses or cubical crystals can be obtained. It is found that gold, like copper and iron, dissolves a certain amount of carbon when in the liquid state, but this separates as graphite on cooling. Gold is found to be less volatile than copper. The properties of distilled gold are the same as those of hammered gold, or the melted metal reduced to a fine powder. Professor Moissan has found no indications of an allotropic modification of gold. When an alloy of copper and gold is distilled, the vapor of copper comes over first, showing that there is no definite compound. In the case of alloys of gold and tin, the latter metal burns in contact with air. This tin oxid is found to be of a purple color, due to a deposit of fine gold on its surface.—*Medical Standard*.

Some Odd Cases in Dental Pathology.—Apropos of plates and their effects, I have had several cases of limited necrosis resulting from them. In one case a lower partial vulcanite denture was found to be very crudely made, and to have a small rough projection upon the gingival surface, which had caused necrosis of the gum and of a portion of underlying bone, the area being about one-quarter inch in diameter, and in depth about one-eighth inch. The treatment

consisted in the surgical removal of the bone with a large sterile rose bur until sensitivity was noted at all points. The necrotic gum edges were curetted, and the surfaces were touched with a saturated solution of trichloroacetic acid in water. The use of the denture was forbidden for a week, and of course the plate was made smooth. Healing took place rapidly.—OTTO E. INGLIS, *Stomatologist*.

To Relieve the Sensitivity of Shallow Erosion Cavities.—In sensitive superficial cavities due to erosion or abrasion, a warm solution of trichloroacetic acid in full strength applied two or three times, the cavity being dried between applications, will often enable one to penetrate to sound, non-sensitive dentin, when the cavity may be prepared as desired.—GEO. GOW, *Dominion Dental Journal*.

Adaptation of Cement to Cavity Walls.—An excellent method of adapting cement to the cavity walls is to take a small bit of the mix at the thick, creamy, or crown-setting stage, and line the walls, which can be easily done, as at this stage it almost flows to place; the rest must be mixed as stiff as possible.

When this stiff mix is packed in, it displaces most of the thinner mix, thereby assuring perfect adaptation. This I consider a very important point, as frequently, when inserting a filling, the cement is inadvertently pulled away from the bottom or margins of the cavity—especially cement mixed to the creamy consistence. In setting dowel crowns we find gelatin tubes a valuable adjunct in carrying the cement to the end of the canal. In placing cement in fine canals, a small loop on the end of the broach will be found to carry the globules to the end better than any other method. To overcome the reflection of inharmonious colors of cement through translucent enamel, the lighter colors of the powder may be pigmented with some metallic oxid to give the desired tint, as for example, a light gray may be made dark in proportion to the quantity of copper oxid used.—ROBERT HOMER WELSH, *Texas Dental Journal*.

The Use of Flexible Rubber in the Retention of Artificial Dentures.—This method is especially applicable to dentures which, owing to the extreme flatness and hardness of the tissues, will not stay in place.

The process of attachment of the flexible strip is as follows: The denture, either upper or lower, is made and vulcanized in the usual manner, and the edges of the plate trimmed so as to completely free the muscles when the mouth is opened or closed, allowing, in the

case of the lower, for the free movement of the tongue. Then a ledge one-eighth inch or slightly less in width is cut with a fissure bur to the depth of the thickness of the flexible rubber to be used. This ledge or groove is made completely around the rim or edge of the plate on the side next to the gums and across the back of the plate, so that it is continuous around the whole plate.

The bottom of this ledge or groove is painted or coated with a solution of base-plate rubber in chloroform, and allowed to dry. Then cut a strip of Doherty's flexible or palate rubber, three-sixteenths of an inch or slightly more in width, place it carefully in this ledge, and pat it down tightly and smoothly with a spatula, the fingers, or other instrument, leaving the flexible rubber projecting beyond the edge of the plate. The ends of the piece or pieces of flexible rubber are thoroughly united by means of a warm spatula, so that it forms a continuous band or piece around the plate.

The whole is then invested in plaster in the flask and revulcanized, after which any necessary trimming and polishing may be done.—NEWELL H. GROVE, *Dental Summary*.

Notes on Lactic Acid in Root-canal Treatment.—I wish to say a few words on the cleansing of root-canals by means of lactic acid, after the removal of gangrenous pulps, and on its use for the removal of discolored dentin in deep-seated cavities. The actual caries in the cavity being removed, and the pulp-chamber well opened and cleansed, I flood the cavity and chamber with absolute alcohol and dry it out well. Non-irritating antiseptics, such as oil of cloves, cinnamon, or creasote, may now be sealed in the cavity. The canals are not touched at the first sitting. Having given the antiseptic two or three days to produce its effect, at the next sitting the putrescent matter of the canal is gradually worked out, care being taken not to force any of it through the apex. Once all the debris is removed, I cleanse the cavity with alcohol, and start by means of cotton attached to a broach to work concentrated lactic acid into the canal, continuing until the cotton upon withdrawal is found to be perfectly clean. Then a Donaldson bristle is used to remove the surface of the dentin, which may be slightly infected. This done, the canals are washed, dried with alcohol, and filled permanently. I have used this method for the last two years with marked success. Up to that time I always resorted to the sodium-dioxid method, followed by a forty per cent. solution of sulfuric acid if enlargement and further

cleansing were necessary. It is a well-known fact that sodium dioxide produces its good results by forming hydrogen dioxide and bleaching the dentin. Lactic acid does the same thing in a somewhat similar manner. It dissolves out the calcium, and with it removes all discolored organic matter.

I have now treated, I suppose, a hundred canals with lactic acid, and can safely say that pericemental trouble has never followed. In fact, if the acid is forced through the apical foramen, it produces a sedative rather than an irritating effect. That is more than I can say of sodium dioxide.

To remove discolored dentin in deep-seated cavities, I merely swab out the cavity with the concentrated acid, and after allowing it to remain there a few minutes, wash it out well with water and dry it with alcohol. I continue this until the discoloration has disappeared. Whether or not this lactic acid brings about a brittle effect upon the tooth-structure is a question I have not determined; at any rate, I have seen no bad results so far.—BASIL JONES, *Australian Journ. of Dentistry*.

Attention to Detail in Taking Impressions of the Mouth.—First, in considering the taking of an impression of the upper edentulous mouth, we would examine the mouth as regards its height in the palate and on the buccal and labial aspects of the ridge, and note the undercuts which occur so often on the labial surface of the ridge and high above the posterior tuberosities. Select a suitable tray—one which will leave about a quarter of an inch of clear space all around it, between its inner surface and the tissue; bend it, if necessary, so as to conform to this measurement. The next step is the building up of a ridge of wax at the posterior edge of the floor of the tray, so that when the tray is in position in the mouth the wax shall come in contact with the soft palate just posterior to the hard palate, or a trifle back of the place where you wish to establish the plate line. When you have the tray in the mouth, place the wax against the tissue and swing the tray up into position in front as if it were hanging on a hinge at the back. The wax addition is a very important one, answering two purposes—viz, preventing the plaster from running over the heel of the tray into the throat, and forcing it to run over on the sides and in front, where it should spread; also the pressure of the wax slightly compresses the soft tissue of the palate and holds it rigid, so that if the patient should swallow, or contract the palatal muscles, the plaster

will not be pulled down, and results in a plate which fits tightly across the heel. The establishing of the plate line in the mouth before the impression is taken is an important precaution. The plate must invariably be carried just a little farther back than the union of the hard and soft palates. After the wax has been properly adapted, and the tray filled with plaster, mixed to a consistency which will easily flow under pressure, the tray is inserted in the mouth, placing the heel in position first with the wax against the palate, and held firmly there; then raise the front of the tray up, forcing the excess of plaster out over the front and sides of the tray. Holding the tray firmly in position and beginning at the median line on the outside, the lip is molded down over the plaster, forcing it back into undercuts and driving out the air, following it back clear to the heel of the tray on each side. In forcing the heel of the tray up first, air-bubbles are more apt to form in the dome of the palate.

The fitting of the tray for the lower impression is of more importance than that for an upper. The lower impression tray should be so bent that the tray shall be shallow at its posterior part on its buccal flanges, and deep enough on its lingual flanges to carry down between the tongue and the ridge; and it should be long enough to extend back and cover the tuberosities. There should be about a quarter-inch space between the lingual flanges of the tray and the lingual sides of the ridge, and it should be so bent that the patient would be able, when the tray is in position, to thrust the tongue forward on top of the tray.—J. A. BULLARD, *Dental Review*.

A Method for Making Gold Inlays Without a Matrix.—After the caries has all been removed from the cavity, if extensive, fill it with a quick-setting cement. Now prepare your cavity so that you will be absolutely sure that there are no undercuts. Wrap a little cotton around a broach and moisten it with a slight lubricating oil. Protect the cavity from moisture with cotton, and wipe the cavity and portion of the tooth surrounding it with the broach moistened with the oil. Now pack moss fiber gold into the cavity, being sure that all of the margins are covered perfectly. This can be done with hand pressure, as it is not desirable that the gold should be over-condensed. Burnish the gold perfectly over the margins, insert a sharp instrument into the center of the filling, and remove it. Cover the surface which would come into contact with the cavity with

alcohol and rouge. Flow solder to the desired contour, insert the filling, and polish it.

This will give as perfect an adaptation as it is possible to obtain with an inlay, and will leave a surface that the cement will adhere to much more perfectly than it would to the matrix, making an inlay with a better adaptation, better retentive qualities, and saving a great deal of time and inconvenience to the patient. This method I have followed for some time, and find it entirely satisfactory.—ARTHUR E. PECK, *American Dental Journal*.

Method of Adapting Matrix to Cavity.

—There are two methods of adapting a matrix to a cavity. It may either be burnished to the cavity in the tooth, or swaged to a cast therefrom. Some operators combine these methods, which insures perfect adaptation. In simple, accessible cavities perfect adaptation of the matrix may be obtained by burnishing; any other method would only complicate the operation and consume time. The possibilities of this method, however, do not end here, for where reasonable skill has been acquired by the operator, it can be employed with success almost universally. But there are cavities so complex that swaging the matrix greatly facilitates its adaptation. While I am free to admit that good inlays may be made from casts of the cavity exclusively, I am of the opinion that in the majority of cases better results can be obtained if the matrix is burnished to the cavity subsequent to its swaging. On account of the uncertainty of materials used for impressions and models, and also of our manipulation of them, we cannot be certain of reproducing absolutely the form of any cavity. I therefore deem it advisable to refer the matrix to the cavity in the tooth for correction by burnishing after it has been swaged to the cast. I would advise that the operator acquire a thorough knowledge of matrix materials and their manipulation in a cavity, and avoid wherever possible that time-consuming—the swaging process. Time will not permit me to detail in full the technique of burnishing and swaging matrices. I will mention only a few of the more important points. The matrix should first be carried to the pulpal walls, burnishing it from this point in all directions to the enamel margins and slightly beyond. During this process the metal should be protected from contact with the burnisher by the use of such materials

as moist cotton or spunk. If a thin matrix be placed between two layers of silk of a very fine texture, its adaptation may be accomplished with the minimum danger of tearing.

The originator of this device is a European dentist, whose name, however, I do not recollect. Chemically pure gum camphor not only aids adaptation under the burnisher, but where a thin matrix has been used, it avoids any possibility of distortion while the matrix is being removed from the cavity. It can subsequently be burned out without leaving any residue. The utmost care must be taken to make certain that the gingival angles of the matrix are in the closest possible relation to the margins of the cavity, as these are vulnerable points. Too often it is thought that the cement will take care of any imperfection in matrix adaptation. This has been a refuge for careless inlay workers, and has caused the work to be unduly ridiculed. The technique for the swaging of a matrix involves the consideration of the materials used for taking the impression and making the casts. For an impression material, hard modeling compound or cement may be used, as both give good results. I prefer the former, as it is cleaner, more easily used, and sets sufficiently hard to give an accurate impression. For casts, low-fusing metals of different kinds, cement, and amalgam have been used. The low-fusing metals are faulty on account of their inability to reproduce sharp angles. Cement has given fairly good results, but in cases of thin-walled cavities its edge strength is not always sufficient. Amalgam, on account of its strength and its property of reproducing sharp lines and angles, is preferable to other materials. Casts, no matter of what material, should include a small area, at least, of the tooth-surface surrounding the cavity. This permits of an overlapping of the margins by the matrix. Before the matrix is swaged, it should be partially adapted—at least to the deeper portions of the cavity—in the cast by the use of burnishers. It is then subjected to one of the many swaging devices. If a swaged matrix is to be burnished in the tooth, it is well to reinforce with gold solder that area of it covering the pulpal walls of the cavity. This reinforcement is specially indicated in large cavities where a thin matrix has been used. This insures greater certainty of marginal adaptation.—W. D. N. MOORE, *Dental Review*.

OBITUARY.

DR. JAMES GOODWILLIE.

DIED, of pneumonia, March 2, 1907, at the Belleclaire Hotel, New York city, JAMES GOODWILLIE, D.D.S., after three days' illness.

Born in Barnet, Vt., in 1836, Dr. Goodwillie was a descendant of a prominent Scotch family of preachers. He studied dentistry under the preceptorship of Dr. White of Cleveland, Ohio, later graduating from the Pennsylvania College of Dental Surgery, February 28, 1861. He began practice in Clinton Place, New York city, shortly afterward, and rapidly acquired an extensive and high-class *clientèle*. He subsequently removed his office to No. 73 West 46th st., and at the time of his death had been in continuous practice for thirty-three years.

Dr. Goodwillie was of an inventive turn of mind, having devised a number of useful improvements in dental appliances, some of which have had general acceptance by the profession. While he had not in recent years been active in dental society work, he was a member and at one time curator of the New York Odontological Society, and was a delegate to the dental section of the International Medical Congress in Berlin in 1890.

Dr. Goodwillie was generally beloved by his friends and colleagues for his many attractive personal attributes. He was married at Berlin, Mass., August 5, 1875, to Miss S. Augusta Frazer, who survives him.

DR. ELBRIDGE BACON.

DIED, at his home in Hollis, Me., February 24, 1907, ELBRIDGE BACON, M.D., D.D.S., in his ninety-seventh year.

Dr. Bacon was born at Barre, Mass., January 13, 1811, remaining on his father's farm until eighteen years of age; for several years following he taught school during the winter. In 1836 he entered the office of his uncle, Dr. Daniel Harwood of Boston, as a student, and remained two years. Coming to Portland in 1838, he began practice at that place, and at the same time entered the

medical school of Maine, from which he received the degree of M.D. in 1839. In 1850 the Baltimore College of Dental Surgery conferred upon him the honorary degree of D.D.S.

Dr. Bacon was a member of the New England Dental Society, the American Academy of Dental Science, and of many other societies. He was one of the founders of the Maine Dental Society in 1867, and its first president. On the twenty-fifth anniversary of this society he was again elected president, and always remained an active and consistent member.

As a professional man, Dr. Bacon was skilful, enthusiastic, and conscientious. As a man he was courteous, kind, and generous, very modest and unassuming—one who was honored, respected, and loved by all. He continued in active practice until past eighty years of age, when an accident compelled his retirement after more than sixty years of practice in Portland.

D. W. F.

DR. SAMUEL WILLIAM DENNIS.

DIED, of pneumonia, at Oakland, Cal., January 20, 1907, SAMUEL WILLIAM DENNIS, M.D., D.D.S., F.R.M.S., aged seventy years.

In the death of Dr. Dennis the dental profession has lost one of its most distinguished members. Beginning his professional life as a dentist in 1860, he took up the study of medicine, and after receiving the M.D. degree from the University of Pennsylvania in 1870, devoted himself almost exclusively to the practice of dental surgery.

Dr. Dennis, who was born in Litchfield, Maine, October 16, 1836, did much through a career lasting over forty-five years to elevate the profession of dentistry, and his devotion to the cause for which he labored may be taken as a true index of the man's high professional ideals.

He framed the bill regulating the practice of dentistry in California, and was president of the first board of dental examiners of

that state. Through his efforts the Dental Department of the University of California was organized, and he was the first occupant of the chair of operative dentistry in that institution.

In 1871 he was elected president of the American Dental Association, and at some later time was president of the California State Dental Association, of which he was the founder.

He received the honorary degree of Doctor of Dental Surgery from the Indiana State Dental College, and in 1881 the degree of Fellow of the Royal Microscopical Society of London was conferred upon him.

Dr. Dennis was married in 1865 to Mary E. Reed of San Francisco, who survives him, together with two children.

DR. G. ARTHUR ROBERTS.

DIED, April 14, 1907, at his home in Toronto, Canada, of heart trouble, G. ARTHUR ROBERTS, D.D.S., aged thirty-four years.

Dr. Roberts was born in Hamilton, Ont., in 1873, and began the study of dentistry in 1893, under the pupilage of Dr. Lennox of Toronto. He was graduated from the Pennsylvania College of Dental Surgery in 1896, and in 1897 started in the general practice of dentistry in Toronto. There he continued in general practice until 1904, when he took up orthodontia as his exclusive work.

By the death of Dr. Roberts the dental profession of Canada loses one of its brightest and most capable members. Although not enjoying good health for some months past, his sudden demise came as a great shock to his many friends and associates. He was examiner in orthodontia for the Royal College of Dental Surgeons, and for the Do-

minion Dental Council; a member of the Odontological Club of Toronto, and of the American Society of Orthodontists, and secretary of the Ontario Dental Society.

DR. A. F. WINKLE.

DIED, of typhoid fever, at 116 Madison ave., New York city, Sunday, March 24, 1907, A. F. WINKLE, D.D.S.

Dr. A. F. Winkle was born in Hanover, Germany, but had been a resident of New York city for almost forty years. He was a graduate of the New York College of Dentistry, class of 1873. Dr. Winkle was a fine type of a Christian gentleman; one who gave generously of his skill and means to many a needy person who could testify to his goodness of heart. Conscientious and honorable, true to himself, to his friends and patients, the deepest regret is felt at the abrupt termination of his well-spent and useful life. He had won a wide reputation for his professional skill, having a large and appreciative *clientèle*, and his many merits as a man and as a dentist earned for him the respect of the community. In his death the dental profession has lost a distinguished member.

The funeral services, Friday, March 29th, were conducted by the Rev. Dr. Charles H. Parkhurst, pastor of the Madison Square Presbyterian Church, of which Dr. Winkle had been a regular attendant for a number of years.

The Rev. G. L. Lomann, pastor of St. Paul's Church, Staten Island, N. Y., a cousin of the deceased, officiated at the interment in the mausoleum of William Warren White in Greenwood Cemetery.

Dr. Winkle was unmarried, and is survived by his sister.

DENTAL LEGISLATION.

NEW DENTAL LAW FOR PENNSYLVANIA.

AN ACT

REGULATING AND DEFINING THE POWERS AND DUTIES OF THE DENTAL COUNCIL AND THE STATE BOARD OF DENTAL EXAMINERS; PROVIDING FOR APPOINTMENT OF EXAMINERS, DEFINING QUALIFICATIONS OF APPLICANTS FOR EXAMINATION, CONDITION OF GRANTING LICENSES, REGULATING AND LIMITING THE PRACTICE OF DENTISTRY; PROHIBITING PRACTICE BY OR EMPLOYMENT OF UNLICENSED PERSONS, AND PROVIDING PUNISHMENT THEREFOR AND DISPOSITION OF FEES AND FINES, AND FIXING THE APPROPRIATION TO THE DENTAL COUNCIL.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same:*

That the Dental Council of Pennsylvania shall consist of the Secretary of Internal Affairs, the Commissioner of Health, the Superintendent of Public Instruction, the president of the Pennsylvania State Dental Society, and the secretary of the Board of Dental Examiners.

The Dental Council may make and adopt for its government all necessary rules, regulations, and by-laws, and shall locate and maintain an office within this state for the transaction of its business. Three members of the Dental Council, one of whom shall be the president of the Pennsylvania State Dental Society or the secretary of the Board of Dental Examiners, shall constitute a quorum for the transaction of business. In case of the absence of the president of the Pennsylvania State Dental Society he may nominate one of the vice-presidents of that society as his proxy with full power to act in his place.

The Dental Council shall elect a president, secretary, and treasurer, whose terms of office shall be for one year or until their successors shall be elected. The president shall be elected only from the members of the Dental Council.

The Dental Council shall supervise and provide rules in conformity with the provisions

of this act for the examination of all applicants for license to practice dentistry in this commonwealth, and shall keep records of their transactions and a registry of all licenses granted by them, stating the name, age, residence, and qualifications of the person licensed to practice dentistry, and whether qualified by examination or otherwise; said registry shall be a public record and accessible as such, and shall be kept at the place provided for the purpose at the capitol in Harrisburg.

The Dental Council shall receive annually the sum of two thousand dollars, to be paid by the State Treasurer on the warrant of the Auditor-general, from which the Dental Council shall pay the salary of its secretary, stenographer and clerks, postage, and all its other expenses, including mileage and ten dollars to each member for each day's attendance at regular meetings of the Dental Council.

SEC. 2. The Dental Council shall have power to grant licenses to practice dentistry in this commonwealth to any person who may be duly qualified under the provisions of this act.

Any person may present to the Dental Council a written application for a license to practice dentistry, together with a fee of twenty-five dollars, and with proof that he or she is not less than twenty-one years of age, is of good moral character, and has obtained a competent education, together with a diploma conferring upon him or her the degree of Doctor of Dental Surgery or other established dental degree from a reputable educational institution maintaining a three years' course in dentistry; thereupon the Dental Council may authorize the examination of such person by the State Board of Dental Examiners.

Upon receiving from the Board of Dental Examiners a report of the examination for license of any applicant who shall have been returned as having successfully passed said examination, the Dental Council shall issue to the applicant a license to practice dentistry in the State of Pennsylvania. Every license to practice dentistry issued pursuant

to this act shall be subscribed by the officers of the Dental Council and by each dental examiner who reported the applicant as having successfully passed an examination such as is provided by this act, and said license shall be sealed with the seal of the Dental Council of the Commonwealth of Pennsylvania and shall be recorded in a book to be kept in the office of the Dental Council, and the number of the book and page therein containing said record shall be noted upon said license.

Upon the recommendation of the Board of Dental Examiners the Dental Council may also issue a license, upon the payment of a fee of twenty-five dollars, to any person who is of good moral character and who shall furnish proof that he or she has a license to practice dentistry granted by the Dental Council or other lawfully constituted authority of any other state or country where the preliminary and professional education required by law is equal to that provided by the laws of this commonwealth.

The Dental Council may also license any applicant who has been in the actual lawful practice of dentistry for not less than ten years upon the report of the Board of Dental Examiners that after due investigation or examination it finds his or her education and professional attainments and experience to be together fully equal to the requirements for license in this commonwealth.

Every license issued otherwise than as a result of a written examination shall state the grounds upon which it is granted.

All fees provided by this act shall be payable to the Dental Council, and the same shall be disbursed by the Dental Council in payment of the expenses of the Board of Dental Examiners: *Provided*, that any surplus unexpended at the end of any fiscal year shall be apportioned among the dental examiners in the proportion of the number of applicants for license respectively examined by each during said fiscal year.

SEC. 3. The Board of Dental Examiners of the Commonwealth of Pennsylvania shall consist of six persons, whose term of office shall be for three years from the first day of September of the year in which they may be appointed.

The Pennsylvania State Dental Society shall have power to nominate from its membership at least double the number of candidates required to fill the vacancies occurring annually in the office of dental examiner (said candidates shall have been engaged in the actual practice of dentistry in this commonwealth during a period of not less than ten years). The Governor of this common-

wealth shall have power to appoint dental examiners to fill all vacancies occurring from any cause only from the candidates nominated as aforesaid. No member of the faculty of a dental college shall be eligible to appointment as a member of the State Board of Dental Examiners.

In the event of failure of the Pennsylvania State Dental Society to nominate candidates as aforesaid, the Governor shall appoint members in good standing of the said society without other restrictions. The Governor shall have power to remove any examiner for continued neglect of duty, incompetency, or dishonorable conduct.

The Board of Dental Examiners may make all necessary rules, regulations, and by-laws concerning the transaction of its business, subject to the approval of the Dental Council, and shall have power to require attendance of persons and papers and take testimony concerning all matters within its jurisdiction; and the presiding officer of said board or of any committee thereof shall have power to issue subpoenas and administer oaths.

SEC. 4. For the purpose of examining applicants for license, the State Board of Dental Examiners shall hold two stated meetings each and every year, to wit, one in June, and one in December. The June meetings shall be held simultaneously in Philadelphia and Pittsburgh; the December meetings shall be held simultaneously in Philadelphia and Pittsburg, or in the discretion of the board may be held in Harrisburg.

Special meetings may be held, the time and place to be fixed by said board. Due notice of all meetings shall be given. At stated and special meetings a majority of the board shall constitute a quorum thereof, but the examinations may be conducted by a committee of one or more of the examiners duly authorized by the said Board.

All candidates for examination for license to practice dentistry in the State of Pennsylvania shall be required to pass an examination by the State Board of Dental Examiners upon the following subjects: *First*, General Anatomy and Physiology. *Second*, Special Dental Anatomy. *Third*, Dental Histology. *Fourth*, Dental Physiology. *Fifth*, Chemistry and Metallurgy. *Sixth*, Materia Medica. *Seventh*, Dental Pathology, Bacteriology, and Therapeutics. *Eighth*, Anesthesia. *Ninth*, Oral Surgery. *Tenth*, Principles and Practice of Operative and Prosthetic Dentistry.

Said examination shall be conducted in writing, and shall embrace all the subjects named in this act. Each applicant shall also furnish to the Board of Dental Examiners

satisfactory evidence of his or her proficiency in the manipulative procedures of dentistry, either by producing an example of his or her work with proof of the execution of the same, or by practical demonstration of his or her skill in the presence of the examiner. After each stated examination an official report signed by the president and secretary and each acting member of the said Board of Dental Examiners, stating the examination average of each candidate in each branch, the general average, and the results of the examination, whether successful or unsuccessful, shall be transmitted to the Dental Council. The said report shall embrace all the examination papers, questions, and answers thereto. All such examination papers shall be filed by the Dental Council at Harrisburg and be kept for reference and inspection for a period of not less than five years.

SEC. 5. It shall be the duty of every person practicing dentistry within this commonwealth to display or cause to be displayed his or her name posted in a conspicuous place at or near the entrance to the office or place where he or she is practicing dentistry. Any person practicing dentistry within this commonwealth within six months from the passage of this act shall cause his or her license to be registered in the office of the prothonotary of the Court of Common Pleas of the county in which such person shall practice dentistry, unless the same has already been registered in said county. Any person who shall neglect to cause his or her license to be registered as herein provided shall be construed to be practicing dentistry without a license: *Provided*, this act shall not affect the right of any person to practice dentistry who is entitled to do so under the provisions of an act of Assembly heretofore in force, or who shall have conducted the actual lawful practice of dentistry in this commonwealth for five years continuously preceding the passage of this act.

SEC. 6. It shall be unlawful for any person to employ any person as an operator in dental surgery or practitioner in dentistry for hire or reward, or to cause or permit any person to act as an operator in dental surgery or as a practitioner in dentistry for hire or reward, who is not duly qualified and registered as a practitioner in dentistry as provided by law.

All persons shall be construed to be prac-

ticing dentistry who shall be the owner, part owner, partner, shareholder, operator, manager, assistant, or in any other manner engaged in conducting any office or other place for the purpose of performing dental operations or treating, extracting, or filling human teeth, or inserting artificial appliances or sets of artificial teeth for hire or reward: *Provided*, that this act shall not prohibit any licensed dentist having any person as assistant or attendant to perform any service other than extracting, filling, treating, or operating upon human teeth or the taking of impressions for and the insertion of artificial appliances in the mouth.

SEC. 7. Nothing in this act shall be construed to prohibit physicians or surgeons in the regular practice of their profession from extracting teeth for the relief of pain or making applications for such purpose, or shall prevent *bona fide* students of dentistry in the regular course of their instruction from operating upon patients at clinics or under the immediate supervision and in the presence of their preceptor who is in lawful practice; provided, that no fee, salary, or other reward for such operation shall be paid to or received by any student of dentistry, either directly or indirectly, under any circumstances. And nothing in this act shall be construed to prohibit the practice of dentistry within this commonwealth by any practitioner who shall have been duly registered in accordance with the laws of this commonwealth existing prior to the passage of this act.

SEC. 8. Any person who shall practice dentistry without being duly licensed or lawfully registered, or who shall practice dentistry or induce any person to practice dentistry in violation of any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction shall be punished by a fine not exceeding five hundred dollars (\$500) or by imprisonment not exceeding six (6) months, or by both fine and imprisonment at the discretion of the court.

All fines recovered under this act from convictions resulting from information instituted at the instance of the Pennsylvania State Dental Society shall be paid to the said society.

SEC. 9. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

Approved—The 7th day of May A. D. 1907.

DENTAL COLLEGE COMMENCEMENTS.

KANSAS CITY DENTAL COLLEGE.

THE twenty-sixth annual commencement exercises of the Kansas City Dental College were held in the First Presbyterian Church, Kansas City, Mo., May 9, 1907.

An address was delivered by Dr. Frank S. Arnold.

The degree of Doctor of Dental Surgery was conferred by Dr. John Deans Paterson on the following graduates:

Nathaniel M. Baskett	William R. Gorrell	Emmett A. Miller	George E. Sheen
Roy R. Duncan	John R. W. Hawk	James A. Roper	Carroll J. Spain
Adolph C. Gardner	George W. Lovett	Ernest Schroers	Harrison R. Watkins
William Glunz	John W. Mays	Thomas D. See	

WESTERN DENTAL COLLEGE.

THE seventeenth annual commencement exercises of the Western Dental College were held Wednesday, May 8, 1907, at Kansas City, Mo.

The annual address was delivered by Dr. M. S. Hughes.

The degree of Doctor of Dental Surgery was conferred by the dean, D. J. McMillen, M.D., D.D.S., on the following graduates:

W. T. Amend	A. S. Eubank	Gus Louwien	J. H. Quinn
Guy Bailey	O. J. Ferris	C. W. Lyon	J. H. Reid
Paul E. Burke	J. W. Fields	C. B. Mendenhall	H. B. Robison
H. F. Cevely	C. A. Gibbons	H. F. Meyers	R. C. Rosson
A. G. Clarke	H. A. Gibbons	D. J. Mitchell	W. G. Ryan
C. E. Cobb	G. R. Hansen	Mark E. Morrison	C. D. Ryder
Leo Coppersmith	A. J. Harrison	J. F. Myers	M. V. Sparr
A. L. Cummings	J. C. Henson	Frank Norris	D. R. Taylor
C. J. Davis	Clarence Hutchison	L. L. Osborn	E. E. Wheeler
Oren De Armond	W. L. Look	H. V. Parker	H. C. Younger
E. G. Ervin			

MEHARRY DENTAL COLLEGE.

THE annual commencement exercises of Meharry Dental College were held Friday, March 29, 1907, in the Ryman Auditorium, Nashville, Tenn.

An address to the graduates was delivered by Dr. Booker T. Washington, and the valedictory by G. D. Smith.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Lafayette Cockrell	Texas	H. W. Lynch	British West Indies
M. C. Cottenn	Colorado	J. J. McKeever	Tennessee
E. T. Fields	Mississippi	G. D. Smith	South Carolina
W. E. Foster	Arkansas	W. S. Stevens	Mississippi
S. W. Jamison	Florida	N. Thomas Wallis	Arkansas
U. G. Johnson	Ohio		

OHIO MEDICAL UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department Ohio Medical University were held in Columbus, Ohio, May 8, 1907.

Addresses were delivered by Herbert Welsh, D.D., and Solomon E. Spangler.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Charles Edward Bishop	Pearl Allen Johnston	Herbert Spencer Shumway
William Henry Cann	Harry Wesley Leitz	Albert Oswin Soldner
Horace Chaney Dean	James Arthur Garfield Lutz	Solomon Emanuel Spangler
Rankin Bennett Embrey	Paul Byron Minton	Harry Leon Stewart
Frank Josiah Fifield	Edgar Delmont Newton	Verla Winfield Taylor
Henry Clifton Fogler	Clarence Craig Patton	Stanley Dustin Vosper
Andrew Nicholas Fox	William Franklin Rodgers	John Henry Warner
John Hayes Guyton	Paul Parker Sherwood	Roland Benjamin Wiltberger
Harman Howland		

BARNES UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of Barnes University were held in St. Louis, Mo., May 10, 1907.

The baccalaureate sermon was delivered by Henry S. Bradley, D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

George Clark Ackley	Missouri	James Almer Case	Missouri
John Quincy Adams	Illinois	Birdie Belle McKellops	Missouri
Mark Webster Ballance	Missouri	Benjamin Franklin Miller	Missouri
Horace Greeley Baugh	Idaho	Herman Osterheld	Missouri
Benjamin Franklin Berry	Illinois	Edgar Roy VanBooven	Missouri
George Washington Burrows	Missouri	Arthur Hugo Winklemeyer	Missouri

INDIANA DENTAL COLLEGE.

THE twenty-eighth annual commencement exercises of the Indiana Dental College were held in English's Opera House, Indianapolis, Ind., May 10, 1907.

An address was delivered by James D. Hoffman, M.E.

The degree of Doctor of Dental Surgery was conferred by Dr. John N. Hurty on the following graduates:

John Franklin Adams	Charles Asbury Eller	Clarence Debria Mitchell
Maurice Palmer Avery	Karl L. Freeman	Robert B. Murphy
John Omar Bicknell	Daniel Ernest Gruber	Chas. Edward Pease
George Coleman Biggs	George Hein	Edward J. Pedlow
Antonio Bogran	William Henry Heyler	Zenana C. Rector
Raymond L. Bosler	Howard Huffman	Everett W. Ross
Arthur James Bower	Edna Ordell Jenkins	Alvin Ardin Smeigh
Earl Brooks	Clyde Lindley Jones	Cecil Hugo Smith
Charles Jacob Burris	Nils Wolner Juell	H. Guy Smith
Howard D. Caton	Phillip Albert Keller	Harry Lloyd Smith
Leroy M. Childers	Bert Koons	D. Kerr Spittler
Ernest Davis Cofield	Harry Albert Koss	Arthur Le Roy Steward
John Wesley Cofield	Rufus B. Kuykendall	George V. Underwood
Bruce Payne Conner	William Joseph McGrath	John M. Walsh
Homer Leonidas Curry	Hugh Parks McKeand	Frank B. Warvel
Dwight D. DuBois	Henry Clay McKittrick	Cyrus Clyde Wright
James Duncan		

SOUTHERN DENTAL COLLEGE.

THE annual commencement exercises of the Southern Dental College were held in the Grand Opera House, Atlanta, Ga., April 26, 1907.

The annual oration was delivered by Rev. Sam W. Small.

The degree of Doctor of Dental Surgery was conferred by Judge Howard Van Epps on the following graduates:

Wilfred P. Adams	William Cooper Humphries	June Chesnutt Patten
John W. Arnold	Edmond H. Hunter	Lawrence Roper
Oscar Lee Barnwell	William B. Hutchings	William F. Schauer
C. Edward Buchanan	Judge Staunton Jones	Daniel M. Sears
D. Benjamin Cardwell	Duncan Bowden Kennedy	J. Clifford Sikes
Jefferson D. Chason	Lucius Mark Lovvorn	Tully Uriah Smith
Clinton Joseph DeLoach	Charles W. Lowe	Emory Speer Souther
George G. Doss	Daniel Joseph McAlhany	Lonnie Murdell Strickland
Joel Lawrence Dowd	Wesley G. McAnally	Ulphian G. Turner
T. N. Evans	Amos A. McManus	Virgil M. Waldroup
Hugh Farrior	Charles L. Martin	James Edward Walker
Louis T. Fields	John E. Ogletree	Talmage Aquilla Weathers
Frank E. Hearn	J. Burkie Patrick	Burt. C. Williamson
Fred L. Huie		

COLORADO COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of the Colorado College of Dental Surgery were held in the Trinity Methodist Episcopal Church, Denver, Colo., Tuesday, May 14, 1907.

Addresses were delivered by W. T. Chambers, D.D.S., and D. E. Phillips, A.M., Ph.D.

The degree of Doctor of Dental Surgery was conferred by Chancellor H. A. Buchtell, D.D., LL.D., on the following graduates:

Robt. Alpheus Bashar	Harry Bennett Evans	Marcus Emmet Pankey
Irving Roy Bertram	Arthur Wallace Heitler	Jesse Herman Royer
John M. Brady	Menifee R. Howard	Theodore Dodd Terry
John Edward Canning	Mrs. Lula Lambert	Russell Uriah Vaughan
Kent Kane Cross	Maurice Monroe McNutt	

KEOKUK DENTAL COLLEGE.

THE annual commencement exercises of the Keokuk Dental College were held May 14, 1907, in the Keokuk Opera House, Keokuk, Iowa.

The doctorate address was delivered by Prof. Frank M. Fuller, A.M., M.D.

The degree of Doctor of Dental Surgery was conferred by Prof. George F. Jenkins, A.M., M.D., on the following graduates:

Frederick J. Arnold	Missouri	E. Lloyd McKenzie	Illinois
Albert Auchampach	Dakota	Geo. R. Narrley	Iowa
Grant Babcock	Iowa	Geo. G. Prettyman	Illinois
Frank J. Colby	Iowa	Fred C. Reeves	Missouri
Logan Dodds	Iowa	Ralph G. Signotte	Minnesota
William E. Flesher	Oklahoma	Edward Smith	Iowa
S. Claudius Herrick	Illinois	Harry D. Stanwood	Iowa
Paul C. Justice	Missouri	Geo. W. Steneker	Iowa
K. S. Leak	Iowa	Arthur E. L. Wirsig	Iowa

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE sixty-seventh annual commencement exercises of the Baltimore College of Dental Surgery were held in Albaugh's Theater, Baltimore, Md., May 10, 1907.

The annual oration was delivered by Rev. Dr. R. P. Kerr, and the valedictorian was L. R. Atwood.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

L. R. Atwood	.....	New York	C. B. Hawley	.....	Connecticut
H. C. Benoit	.....	Massachusetts	E. B. Keighley	.....	Rhode Island
J. G. Boozer	.....	South Carolina	F. L. K. Laflamme	.....	Maine
W. S. Braddock	.....	Pennsylvania	J. R. Mabree	.....	New Jersey
W. R. Burk	.....	Rhode Island	H. M. MacDonald	.....	Massachusetts
A. L. Cheney	.....	Massachusetts	F. H. Mitchell	.....	Maine
H. M. Childs	.....	Minnesota	J. Morel	.....	Cuba
W. F. Clayton	.....	South Carolina	F. H. Parks	.....	Canada
E. G. Click	.....	North Carolina	S. P. Purvis	.....	North Carolina
A. B. Corder	.....	New York	H. B. Rogers	.....	West Virginia
B. D. Corl	.....	North Carolina	A. C. Schwartz	.....	Pennsylvania
D. F. Donohue	.....	Connecticut	P. D. Sinclair	.....	North Carolina
D. P. Driscoll	.....	Massachusetts	P. F. Slocumb	.....	Canada
B. F. Ellis	.....	Prince Edward Island	H. W. Snow	.....	Canada
J. Fernandez	.....	Cuba	R. C. Steigerwald	.....	Pennsylvania
L. R. Fritts	.....	New Jersey	H. A. Warren	.....	Massachusetts
G. M. Galloway	.....	Mississippi	S. W. Webb	.....	Maryland
J. I. Gardner	.....	Virginia	G. R. Wells	.....	West Virginia
F. D. Garland	.....	Rhode Island	B. L. Wilkerson	.....	Georgia
J. J. Gross	.....	Maryland	A. Zabriskie	.....	New Jersey
J. A. Guerrero	.....	Cuba			

MARQUETTE UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Marquette University, Department of Dentistry, were held in the Davidson Theater, Milwaukee, Wis., on May 14, 1907.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

C. Beuthien	A. Frackelton	B. W. Maercklein	R. A. Schott
W. M. Dettman	R. H. Hanke	J. F. Mortell	I. B. Thackery
A. C. Dietrich	E. J. Lunz	A. J. O'Connor	

MEDICAL COLLEGE OF VIRGINIA, DENTAL DEPARTMENT.

THE annual commencement exercises of the Medical College of Virginia, Dental Department, were held May 21, 1907, in the Jefferson Auditorium, Richmond, Va.

An oration was delivered by Geo. W. McDaniel, B.A., D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

C. E. Crawford	W. H. Johnson	L. D. Lewis	H. E. Price
J. G. Harris	P. V. King	G. W. Parker	R. G. Rogers

ST. LOUIS DENTAL COLLEGE.

At the annual commencement exercises of the St. Louis Dental College an address was delivered by the Rev. — Young.

The degree of Doctor of Dental Surgery was conferred by the dean, Dr. M. C. Marshall, on the following graduates:

John Henry Allen	Illinois	Charles Emmet Lynott	Missouri
Wayne Harold Bigler	Kansas	Mary Burnett McKee	Illinois
John Frederick Boeke	Missouri	Lee Roy Main	Illinois
John R. Bunch	Texas	Lucien Arthur Mannahan	Illinois
Frederick Demko, Jr.	Missouri	Howard Alfred Moreland	Illinois
Myron Daniel Eddleman	Illinois	Raymond Joseph Padberg, A.B.	Missouri
Edmund Wilkes Emery	Kansas	John Francis Paschek	Missouri
Alvia William Farrington	Missouri	William David Pence	Illinois
Thomas Francis Fleming	Missouri	Richard George Sendke	Missouri
William Charles Gerstenkorn	Texas	James Logan Shanklin	Washington
Adolph Theodore Gissy	Illinois	Guy Singletary	Kentucky
James Reuben Gossett	Texas	Charles Albert Slawson	Missouri
Charles Louis Gove	Missouri	George Henry Slawson	Missouri
Robert Riley Hardesty	Missouri	Leo Marion von Nahmen	Missouri
Burton Oliver Haun	Missouri	William Leopold von Nahmen	Missouri
Edward C. Kennen, Jr.	Missouri	Elmer Orville Williams	Missouri
Halley Kirkendall	Missouri	Russel Tweed Dale Witty	Missouri
Wendell Tuttle Kitchell	Missouri	Rudolph Heman Wolf	Illinois
Otto Ray Lee	Missouri		

STATE DENTAL COLLEGE, TEXAS.

THE annual commencement exercises of the State Dental College, Texas, were held in Carnegie Hall, Dallas, Texas, May 9, 1907.

The doctorate address was delivered by Hon. Barry Miller.

The degree of Doctor of Dental Surgery was conferred by Dr. T. G. Bradford on the following graduates:

C. B. Slaughter

O. L. Smith

E. H. Ramsey

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: June, July, and August, 1907.

JUNE.

AMERICAN MEDICAL ASSOCIATION—SECTION on STOMATOLOGY. Atlantic City. Four days: June 4th to 7th.

COLORADO STATE DENTAL SOCIETY. Colorado Springs. Three days: June 20th to 22d.

FLORIDA STATE DENTAL SOCIETY. Atlantic Beach. Three days: June 6th to 8th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 11th to 13th.

MASSACHUSETTS DENTAL SOCIETY. Boston. Three days: June 5th to 7th.

MICHIGAN STATE DENTAL ASSOCIATION. Saginaw. Two days: June 4th and 5th.

MISSOURI STATE DENTAL ASSOCIATION. Kansas City. Three days: June 4th to 6th.

NEW HAMPSHIRE DENTAL SOCIETY. Plymouth. Three days: June 25th to 27th.

NORTH CAROLINA STATE DENTAL SOCIETY. Morehead City. Three days: June 26th to 28th.

SOUTH DAKOTA DENTAL SOCIETY. Sioux Falls. Three days: June 4th to 6th.

TEXAS STATE DENTAL ASSOCIATION. San Antonio. Three days: June 13th to 15th.

UTAH STATE DENTAL ASSOCIATION. Salt Lake City. Two days: June 7th and 8th.

JULY.

MAINE DENTAL SOCIETY. Rockland. Three days: July 16th to 18th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Minneapolis. Three days: July 26th to 29th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Minneapolis. July 26th.

NATIONAL DENTAL ASSOCIATION. Minneapolis. Four days: July 30th to August 2d.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 17th to 19th.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburgh. Three days: July 9th to 11th.

SOUTH CAROLINA STATE DENTAL ASSOCIATION. Anderson. Four days: July 2d to 5th.

TENNESSEE STATE DENTAL ASSOCIATION. Knoxville. Three days: July 8th to 10th.

AUGUST.

FIRST FRENCH CONGRESS OF STOMATOLOGY. Paris. Five days: August 1st to 5th.

INTERNATIONAL DENTAL FEDERATION. Amsterdam. Two days: August 8th and 9th.

Examiners' Meetings.

CALIFORNIA BOARD OF EXAMINERS. Los Angeles, June 10th; San Francisco, June 17th.
CONNECTICUT DENTAL COMMISSIONERS. Hartford. June 13th to 15th.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS. Washington. July 1st to 3d.

FLORIDA BOARD OF EXAMINERS. Jacksonville. June 3d.

ILLINOIS BOARD OF EXAMINERS. Chicago. June 3d.

INDIANA BOARD OF EXAMINERS. Indianapolis. June 11th to 13th.

IOWA BOARD OF EXAMINERS. Iowa City. June 6th to 11th.

KENTUCKY BOARD OF EXAMINERS. Louisville. June 4th.

MAINE BOARD OF EXAMINERS. Portland. July 8th.

MINNESOTA BOARD OF EXAMINERS. Minneapolis. June 6th to 8th.

NEW HAMPSHIRE BOARD OF REGISTRATION. Manchester. June 11th to 13th.

NORTH CAROLINA BOARD OF EXAMINERS. Morehead City. June 24th to 26th.

PENNSYLVANIA BOARD OF EXAMINERS. Philadelphia and Pittsburgh. June 12th to 15th.

OHIO BOARD OF EXAMINERS. Columbus. June 25th to 27th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. July 9th to 11th.

SOUTH CAROLINA BOARD OF EXAMINERS. Anderson. June 28th.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. June 6th.

TEXAS BOARD OF EXAMINERS. San Antonio. June 10th.

VERMONT BOARD OF EXAMINERS. Montpelier. July 1st to 3d.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 11th.

WEST VIRGINIA BOARD OF EXAMINERS. Wheeling. June 12th to 14th.

WISCONSIN BOARD OF EXAMINERS. Milwaukee. June 10th.

WYOMING BOARD OF EXAMINERS. Sheridan. July 1st to 3d.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next meeting of the *Fédération Dentaire Internationale*, to be held at Amsterdam on August 8 and 9, 1907, promises to be one of exceptional interest, as a number of questions of great importance to the federation, as well as to the whole profession, must receive thorough consideration at that time.

Our experience has brought out a number of points in the rules and regulations which require to be cleared up. The question of a pamphlet containing specific directions for the care of the teeth, presented in a form adapted to widest circulation among the poor, is also to receive its final settlement at Amsterdam.

Particular attention will be devoted to a matter which after a period of comparative quiet is again agitating the minds of dental teachers and practitioners, and which concerns the education which in future should be demanded of the dentist. The question whether the dentist should above all things be a full graduate in medicine, with a knowledge, more or less complete, of dentistry superadded, or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make on him, is one which the F. D. I. has already pronounced upon in its session at Stockholm in August 1902. It cannot, however, be considered as having been definitely disposed of. It is, on the contrary, perhaps more acute at present than at any previous period in the history of our professional development.

The position of the F. D. I. having become more firmly established and its vote more authoritative, it is very desirable that its opinion should again be heard on this most important question, and every member should come prepared to give definite expression to his views.

Another point to be dealt with relates to the action of the committee of organization of the next international medical congress to be held in Budapest in 1909, in excluding from participation dentists who do not possess the medical degree. A consideration of the rights and duties of the F. D. I. in connec-

tion with the international dental congress to be held in Berlin in the same year will also take up some of the time.

These are a few of the matters which require special attention, and I sincerely hope that members will make every possible effort to be present. The steps taken toward the founding of an intellectual world-center at the Hague, if realized—and there seems to be every reason for trusting that such will be the case—will give an impulse to internationalism which will add greatly to the significance and importance of the F. D. I., and the hopes that it will be able to accomplish much in the interest of our profession and of humanity at large seem nearer fulfillment now than ever before.

W. D. MILLER, *President.*

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompret, general secretary; Dr. Gires, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Subscriptions and communications should be addressed to

DR. CHOMPRET, *General Sec'y,*
182 rue de Rivoli, Paris.

PRIZE OFFERED BY ROTTER- DAM DENTAL SOCIETY.

A GNATHO-DYNAMOMETER WANTED.

The Rotterdamsche Tandheelkundige Vereeniging offers a reward of f. 300 (\$120, £25) for the invention of a gnatho-dynamometer that will be suited for use in dental practice.

The instrument must be able to record a maximum pressure of at least 200 kilograms. Below 20 kgm. the limit of error must not exceed 1 kgm., while with heavier pressure it should remain within 2 kgm.

The bite-contact plates must allow the making of a record within a distance of 1cm.

Although the instrument has only to record the pressure in one direction, it ought to work also with a moderate lateral movement. With the front teeth, only the pressure with edge-to-edge bite, not with overbite, is to be measurable.

The instrument must be simple, strong, and capable of being sterilized as far as it comes in contact with the mouth. The bite-plates must not do damage to the teeth. When used, the recording apparatus ought to be readjustable.

Competitors are requested to send, free, specimens until October 1, 1908, to the Rotterdamsche Tandheelkundige Vereeniging, 115 Aert van Nesstraat, Rotterdam, accompanied by a motto and a description of the mode of use; and in addition a sealed envelope signed with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, I. J. E. de Vries, Amsterdam; C. H. Witthaus, Rotterdam; besides a technical expert. The jury will make its decision in December 1908.

The result will be communicated to all competitors, and their instruments will be returned.

The prize will be delivered in January 1909, during the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

Dental and technical papers are requested to publish this notice.

M. ISEBREE MOENS, *Sec'y.*

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

FOLLOWING is the program of the American Medical Association—Section on Stomatology, for its annual meeting at Atlantic City, N. J. June 4 to 7, 1907:

1. Chairman's Address. M. I. Schamberg, New York city.
2. "The Necessity of a Medical Education for Dentists."
 - (a) "From the Standpoint of the Lay Public." M. L. Rhein, New York city, H. C. Register, Philadelphia, and James McManus, Hartford, Conn.
 - (b) "From the Standpoint of the Physician." V. A. Latham, Chicago.

3. "The Common Ground of Dentistry and Medicine." F. L. Fossum, New York city.
4. "The Mutual Development Dependence of the Upper Air-Tract, the Jaws, the Teeth, and the Face; and their Economic Importance to the Human Race." W. Sohler Bryant, New York city.
5. "The Relation of Upper Respiratory Obstruction to Oral Deformity. Simultaneous Treatment by Expansion of the Dental Arch." Francis A. Faught, Philadelphia.
6. "Speech Results of Cleft Palate Operations." George V. I. Brown, Milwaukee.
7. "Technique of Lip and Palate Operations." Thomas Fillebrown, Boston.
8. "False Statements Concerning Causes of Pathological Conditions." S. B. Luckie, Chester, Pa.
9. "Acid Auto-intoxication; the Principal Cause of Erosion and Abrasion." Eugene S. Talbot, Chicago.
10. "Some Results from Orthodontia on the Deciduous Teeth." E. A. Bogue, New York city.
11. "Osteomyelitis of the Maxilla." Samuel L. Goldsmith, New York city.
12. "A Case of Epidermoid Carcinoma of the Inferior Maxilla." W. H. Potter, Boston.
13. "Pregnancy: a Factor in the Etiology of Dental Diseases." James E. Power, Providence, R. I.
14. "The Dentist in the United States Navy." Richard Grady, Annapolis.
15. "The X Ray an Aid to the Stomatologist." R. G. Richter, Milwaukee.
16. "Radiography in Oral Surgery, with Demonstrations of a Focus Finder and Ray Localizer." G. E. Pfahler, Philadelphia.

M. I. SCHAMBERG, *Chairman.*
EUGENE S. TALBOT, *Sec'y.*

NOTICE FROM N. D. A. COMMITTEE ON HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive

history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further de-

lay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.

WM. H. TRUEMAN, Philadelphia.

GORDON WHITE, Nashville, Tenn.

H. L. AMBLER, Cleveland, Ohio.

JAS. MCMANUS, Hartford, Conn.

J. Y. CRAWFORD, Nashville, Tenn.

A. H. FULLER, St. Louis, Mo.

S. A. FREEMAN, Buffalo, N. Y.

W. E. BOARDMAN, Boston, Mass.

CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.

CHAS. MCMANUS, *Ch'man*, Hartford, Conn.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the European plan. Any room in the hotel is capable of accommodating two people. All the rooms have telephone connection, and hot and cold water. Railroad rates will be given later.

The Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,

29 Fulton st., Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in Minneapolis, Minn., commencing at 2 P.M., Friday, July 26, 1907.

The Executive Committee will meet at 10 A.M. the same day. The West Hotel has been selected as headquarters and place of meeting. Hotel rates as published in the notices of the meeting of the National Association of Dental Examiners will prevail.

H. B. TILESTON, *Ch'man Ex. Committee*,
B. HOLLY SMITH, *Sec'y Ex. Committee*,
1007 Madison ave., Baltimore, Md.

NATIONAL DENTAL ASSOCIATION.

THE eleventh annual session of this association will be held in Minneapolis, July 30 and 31, and August 1 and 2, 1907, when a full program of essays, demonstrations, and clinics will be presented. The largest meeting in the history of the association is confidently expected. Full program in July journals.

The Plaza Hotel, situated one-half block from where the clinics will be held, has been secured as headquarters; rates—European plan—\$2.00 per day and upward. At the West, Nicollet, and Majestic hotels the rates—European plan—will be \$1.00 per day and upward. Reduced rates will be secured.

The following are the officers of the sections and chairmen of clinics and local arrangements:

SECTION I:

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

D. O. M. LE CROON (chairman), Missouri Trust bldg., St. Louis, Mo.

W. G. MASON (vice-chairman), Tampa, Fla.

E. P. DAMERON (secretary), 58 De Menil bldg., St. Louis, Mo.

SECTION II:

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

WM. CRENSHAW (chairman), 621 Prudential bldg., Atlanta, Ga.

JOHN I. HART (vice-chairman), 118 W. Fifty-sixth st., New York city.

J. J. SARRAZIN (secretary), Godchaux bldg., New Orleans, La.

SECTION III:

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR (chairman), 35 W. Forty-sixth st., New York city.

W. H. G. LOGAN (vice-chairman), 785 Winthrop ave., Chicago, Ill.

M. L. RHEIN (secretary), 38 E. Sixty-first st., New York city.

CLINICS.

E. K. WEDELSTAEDT (chairman), 204 New York Life bldg., St. Paul, Minn.

SECTION ON INLAYS.

WALTER N. MURRAY (chairman), 601 Medical blk., Minneapolis, Minn.

LOCAL COMMITTEE OF ARRANGEMENTS.

F. B. KREMER (chairman), Masonic Temple, Minneapolis, Minn.

Delegates received only from state societies, but a cordial invitation is extended to all reputable practitioners to attend the meeting.

C. S. BUTLER, *Sec'y*,
267 Elmwood ave., Buffalo, N. Y.

A. H. PECK, *President*,
92 State st., Chicago, Ill.

Section I.

PARTIAL PROGRAM.

The following papers have been secured so far:

"The Over-Arch in Bridge Work." By L. C. Bryan, Basel, Switzerland.

"Some Practical Experiences Theoretically Expressed." By Emory A. Bryant, Washington, D. C.

"Treatment of Malocclusion of the Deciduous Teeth." By Guilhermena P. Mendel, Minneapolis, Minn.

"Evolution." By Chas. L. Hungerford, Kansas City, Mo.

"The Effect of Excess of Mercury upon Shrinkage, Expansion, Edge Strength, Flow, Change in Composition, and Stability of the Dental Amalgam Alloys." By Marcus L. Ward, Detroit, Mich.

"Porcelain." By C. M. Work, Ottumwa, Iowa.

"Physical Condition of or Pertaining to the Human Teeth." By F. G. Corey, Council Grove, Kans.

"Method of Replacing Broken Facings on Crowns and Bridges." By J. V. Conzett, Dubuque, Iowa.

There will be a few additions to the list, as returns are not yet in.

D. O. M. LeCROON, *Ch'man*,
E. P. DAMERON, *Sec'y*.

Clinic Section.

THERE is every indication that there will be a large clinic held in Minneapolis on July 31st and August 1st. Many men have signified their intention to be present and take part in either the operative work, or else give some kind of a table clinic. If I am to judge from what has been written to me, we shall have a most interesting meeting, so far as the clinic is concerned.

The following gentlemen are acting as district and state chairmen:

DISTRICT AND STATE CHAIRMEN.

New England States. Dr. G. E. Savage, Worcester, Mass.

New York. Dr. F. L. Fossum, N. Y.

New Jersey, Delaware, and District of Columbia. Dr. M. F. Finley, Washington, D. C.

Maryland. Dr. C. M. Gingrich, Baltimore, Md.

Virginia and West Virginia. Dr. F. W. Stiff, Richmond, Va.

North and South Carolina and Georgia. Dr. H. H. Johnson, Macon, Ga.

Florida, Alabama, and Mississippi. Dr. A. T. Reeves, Selma, Ala.

Tennessee and Kentucky. Dr. W. M. Slack, Memphis, Tenn.

Pennsylvania. Dr. H. E. Friesell, Pittsburgh.

Ohio. Dr. H. C. Brown, Columbus.

Indiana. Dr. C. D. Lucas, Indianapolis.

Illinois. Dr. F. W. Gethro, Chicago.

Wisconsin. Dr. S. H. Chase, Madison.

Ontario.

Manitoba. Dr. K. C. Campbell, Winnipeg.

It is not an easy matter to arrange the program, and I shall be grateful to all the chairmen for their list of clinicians. The earlier the list is sent the better.

Dr. W. N. Murray, the chairman of the Inlay Section, will have everything which is

new and of interest demonstrated in cavities in the human teeth. There will be no less than twenty clinical operations. The foremost men in the profession who are believers in the use of some kind of an inlay will be on hand, ready not only to demonstrate, but to do everything possible that might interest others in their specialty. Dr. F. S. Yeager will have entire charge of this special department, and he will appoint his own corps of assistants.

Those interested in metal fillings may rest assured that this special part of the clinic will not be neglected. The members of the G. V. Black Dental Club of St. Paul, the Conzett Club of Iowa, the Searl Metal Filling Club, the Woodbury Club of Council Bluffs, as well as other organizations of the kind, have signified their intention to be present and take an active part in the clinic. Members of these various organizations are so favorably known that it seems needless for me to say anything about them.

There is every evidence at hand that the table clinics will be along their usual high order. Everything which is of value will be demonstrated for the benefit of those who attend.

Special demonstrations have been arranged for the first day of the clinic. Dr. Wm. Finn of Cedar Rapids, Iowa, one of the leading teachers of advanced work in the middle west, will bring with him to the meeting large wooden teeth with cavities cut in various surfaces. Dr. Finn will demonstrate the Black methods of preparing and filling cavities with metal fillings. There will also be a number of young ladies present—dental assistants—who will demonstrate the Black method of preparing gold cylinders and pellets. These demonstrations will take place at the first day's clinical session.

Another thing which may be of interest to a great many practitioners is a clinic which will take place at the second day's clinical session. A patient having approximating cavities in the upper right bicuspid will be operated upon by brothers—Dr. C. N. Beemer of Mason City, Iowa, will fill the cavity in the mesio-occlusal surface of the second bicuspid, and upon its completion Dr. H. J. Beemer of Newton, N. J., will make the operation in the disto-occlusal surface of the first bicuspid. This operation will give everyone

who is interested a chance to observe the methods employed by two men who live in different sections of the country, but who are practicing along similar lines. These are just some of the side issues, so to speak.

In the past, the time mentioned on the program for the beginning of the operations has been understood to mean any time that would suit the operator. I do not know what the clinicians will do at the first day's session. The operations to be made at the second day's session will begin promptly on time.

The clinical program will be published next month.

E. K. WEDELSTAEDT, *Ch'man Clinio Section*,
N. Y. Life bldg., St. Paul, Minn.

MICHIGAN STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE annual meeting of the Michigan State Dental Association will be held in Saginaw, June 4 and 5, 1907. All ethical practitioners are cordially invited to attend.

L. N. HOGARTH, *Sec'y*, Detroit, Mich.

FLORIDA STATE DENTAL SOCIETY.

THE twenty-fourth annual meeting of the Florida State Dental Society will be held in the ballroom of the Hotel Continental, at Atlantic Beach, Thursday, June 6, 1907, continuing in session three days. All ethical practitioners of dentistry are cordially invited to attend.

CARROLL H. FRINK, *Cor. Sec'y*,
Fernandina, Fla.

SOUTH DAKOTA DENTAL SOCIETY.

CHANGE OF DATE OF MEETING.

THE twenty-fifth annual meeting of the South Dakota Dental Society will be held at Sioux Falls, June 4, 5, and 6, 1907.

A most interesting program has been arranged, and we want to see the largest attendance the society has ever had. A larger membership is desired, and every eligible dentist in the state should become a member. Dentists of southeastern Minnesota and northwestern Iowa are specially invited.

FERDINAND BROWN, *Sec'y*, Sioux Falls.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CONVENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, St. Louis, Mo., *Chairman*.

H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.

F. W. STIFF, Richmond, Va., *Treasurer*.

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

THE Jamestown Dental Convention will be held in a specially equipped building on the Exposition grounds which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits, and all of these will be held in it. The entrance is outside of the grounds, but access to the grounds may be obtained through it. The building is wired with both direct and alternating current, equipped with running water, is well lighted, and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce bldg., Norfolk, Va. To him exhibitors should apply at once for space—price per foot and a plan of the hall will be sent upon request.

The clinics at the convention are under the supervision and direct control of Dr. C. J. Grieves, Park and Madison aves., Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each state in the Union and near countries, viz, Canada, Mexico, Cuba, and Hawaii. From these come reports of the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen are given with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace st., Richmond, Va., who reports memberships rapidly coming in.

The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. Later reports as to hotel accommodations and prices will appear in a subsequent issue.

The membership fee is five dollars, which will entitle members to receive a bound copy of the proceedings. A half-rate—\$2.50—is made to *bona fide* dental students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee for indorsement and acceptance will entitle them to the rights and privileges of the convention.

The essayists are to be Prof. W. D. Miller of Berlin, Germany, "Demonstration of Preparations Relating to the Wasting (so-called Erosion) of the Teeth"; Dr. F. T. Van Woert of Brooklyn, N. Y., "Is the Cemented Filling the Filling of the Future?" Dr. Chas. L. Alexander of Charlotte, N. C., "Gold Inlays," and Dr. R. Ottolengui of New York city, "The Angle Method in Orthodontia."

Dr. E. P. Beadles was elected by the Committee on Organization in February to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention.

The following officers were elected by the Committee of Organization at its recent meeting, February 23, 1907.

Officers.

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-president—Dr. B. Holly Smith, Baltimore, Md.

Secretary-general—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

Vice-presidents—Chas. L. Alexander, Charlotte, N. C. R. R. Andrews, Cambridge, Mass. Waldo E. Boardman, Boston, Mass. Wm. M. Bebb, Los Angeles, Cal. G. V. Black, Chicago, Ill. Edwin C. Blaisdell, Portsmouth, N. H. F. A. Blanchard, Marksville, La. George W. Boynton, Washington, D. C. Truman W. Brophy, Chicago, Ill. Geo. V. I. Brown, Milwaukee, Wis. H. J. Burkhart, Batavia, N. Y. Chas. S. Butler, Buffalo, N. Y. Wm. Carr, New York, N. Y. Arthur W. Chance, Portland, Ore. Norris R. Cox, Portland, Ore. Wm. Crenshaw, Atlanta, Ga. W. A. Cudworth, Milwaukee, Wis. L. E. Custer, Dayton, Ohio. W. G. Dalrymple, Ogden, Mo. Edwin T. Darby, Philadelphia, Pa. John W. David, Corsicana, Tex. A. J. Derby, Honolulu, Hawaii. Max M. Eble, Louisville, Ky. Edward Eggleston, Richmond, Va. L. C. Elkins, St. Augustine, Fla. W. Leon Ellerbeck, Salt Lake City, Utah. W. W. Evans, Washington, D. C. J. Falero, City of Mexico, Mex. Geo. L. Field, Detroit, Mich. Ricardo Figueroa, City of Mexico, Mex. R. D. Griffin, Paris, Tex. Chas. L. Gunn, Gadsden, Ala. J. A. Hall, Collinsville, Ala. T. M. Hampton, Helena, Mont. Geo. Edwin Hunt, Indianapolis, Ind. Chas. F. Irwin, Vancouver, Washington. S. H. Johns, Wilmington, Del. H. H. Johnson, Macon, Ga. S. F. Kemp, Key West, Fla. H. F. King, Fremont, N. H. Edward C. Kirk, Philadelphia, Pa. D. O. M. LeCron, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa. Geo. E. Longeway, Gt. Falls, Mont. A. A. McClanahan, Springfield, Tenn. T. T. McClanahan, Nashville, Tenn. A. C. McCurdy, Towson, Md. L. B. McLaurin, Natchez, Miss. James McManus, Hartford, Conn. D. J. McMillen, Kansas City, Mo. W. G. Mason, Tampa, Fla. Chas. A. Meeker, Newark, N. J. A. S. Melendy, Knoxville, Tenn. T. M. Milam, Little Rock, Ark. J. H. E. Milhous, Blackville, S. C. W. D. Miller, Berlin, Ger. Geo. E. Mitchell, Haverhill, Mass. T. T. Moore, Columbia, S. C. Garrett Newkirk, Pasadena, Cal. L. G. Noel, Nashville, Tenn. W. E. Norris, Charlottesville, Va. J. R. Osborne, Shelby, N. C. R. Ottolengui, New York, N. Y. F. A. Shotwell, Rogersville, Tenn. J. D. Patterson, Kansas City, Mo. A. H. Peck, Chicago, Ill. R. W. Quarles, Van Buren, Ark. H. C. Register, Philadelphia, Pa. D. N. Rust,

Washington, D. C. R. M. Sanger, Orange.
 N. J. A. C. Searl, Owatonna, Minn. Alton
 H. Thompson, Topeka, Kans. Pitt S. Turner,
 Belton, Tex. Geo. S. Vann, Gadsden, Ala.
 F. T. Van Woert, Brooklyn, N. Y. Andreas
 C. Weber, Havana, Cuba. E. K. Wedelstaedt,
 St. Paul, Minn. Geo. H. Wilson, Cleveland,
 Ohio. John E. Woodward, New Orleans, La.
 C. M. Work, Ottumwa, Iowa.

Clinics.

General Clinic Committee. Clarence J.
 Grieves (chairman), Park and Madison aves.,
 Baltimore, Md. Baskerville Bridgeforth,
 Richmond, Va. E. J. Tucker, Roxboro, N. C.
 H. Herbert Johnson, Macon, Ga. F. A.
 Bowles, Washington, D. C. Joseph T. Mead-
 ors, Nashville, Tenn.

STATE CHAIRMEN FOR CLINICS.

Alabama. L. A. Crumly, Hood bldg., Bir-
 mingham.

Arkansas. Chas. Richardson, Fayetteville.

California. Frank L. Platt, 712 Steiner st.,
 San Francisco.

Connecticut. Chas. McManus, 80 Pratt st.,
 Hartford.

Colorado. W. E. Sinton, El Paso bldg.,
 Colorado Springs.

Delaware. C. R. Jeffries, New Century
 bldg., Wilmington.

District of Columbia. H. J. Allen, 303-04
 Colorado bldg., Washington.

Florida. Carroll H. Frink, Fernandina.

Georgia. A. M. Jackson, Macon.

Idaho. J. B. Burns, Payette.

Indian Territory—S. E. Long, South Mc-
 Alester.

Indiana. Carl D. Lucas, Willoughby bldg.,
 Indianapolis.

Iowa. C. M. Work, Ottumwa.

Kansas. Frank O. Hetrick, Ottawa.

Kentucky. E. D. Rose, Bowling Green.

Louisiana. Jules J. Sarrazin, New Or-
 leans.

Maine. H. A. Kelley, 609 Congress st.,
 Portland.

Maryland. George E. Hardy, Baltimore.

Michigan. E. B. Spalding, 4 Adams ave.,
 West Detroit.

Massachusetts. C. W. Rodgers, Dorchester.

Minnesota. J. W. S. Gallagher, Winona.

Mississippi. W. R. Wright, Jackson.

Missouri. E. P. Dameron, DeMenil bldg.,
 St. Louis.

Montana. G. E. Longeway, Great Falls.

Nebraska. H. A. Shannon, Lincoln.

Nevada. J. C. Hennessy, Reno.

New Hampshire. John W. Worthen, Con-
 cord.

New Jersey. C. W. F. Holbrook, 2 Say-
 brook place, Newark.

New York. Wm. Dwight Tracy, New York.

North Carolina. J. A. Gorman, Asheville.

North Dakota. C. L. Rose, Fargo.

Ohio. H. C. Brown, 185 E. State st., Co-
 lumbus.

Oklahoma. Theo. P. Bringhurst, Shawnee.

Oregon. Arthur W. Chance, Dekum bldg.,
 Portland.

Pennsylvania. H. B. McFadden, 3505
 Hamilton ave., Philadelphia.

Rhode Island. Dennis F. Keefe, 315 Butler
 Exchange, Providence.

South Carolina. Thomas T. Moore, Jr.,
 Columbia.

South Dakota. E. S. O'Neil, Canton.

Tennessee. A. J. Cottrell, Knoxville.

Texas. John W. David, Corsicana.

Utah. William Leon Ellerbeck, 21 Hooper
 bldg., Salt Lake City.

Vermont. E. O. Blanchard, Randolph.

Virginia. R. L. Simpson, Richmond.

Washington. C. A. Custer, Chapin block,
 Seattle.

West Virginia. F. L. Wright, Wheeling.

Wisconsin. W. A. Cudworth, Milwaukee.

Mexico. J. Falero, 18 Tacuba, City of
 Mexico.

Cuba. Andres G. Weber, Corales 1 Es-
 quina Egido, Havana.

Hawaii. A. J. Derby, Honolulu.

Membership.

General Membership Committee. F. W.
 Stiff (chairman), 600 East Grace st., Rich-
 mond, Va. A. S. Melendy, Knoxville, Tenn.
 Wm. Crenshaw, Atlanta, Ga. M. S. Merchant,
 Mason bldg., Houston, Tex.

STATE CHAIRMEN FOR MEMBERSHIP.

Alabama. C. S. Gunn, Gadsden.

Arkansas. T. M. Milam, Mann bldg., Little
 Rock.

California. J. Lorenz Pease, Oakland.

Connecticut. Frederick T. Murless, Jr.,
 Windsor Locks.

Colorado. Henry F. Hoffman, 612 Cali-
 fornia bldg., Denver.

Delaware. S. H. Johns, Wilmington.

District of Columbia. Wm. N. Cogan,
 Washington.

Florida. F. E. Buck, Jacksonville.

Georgia. Walter G. Miller, Augusta.

- Idaho.* J. H. Lewis, Nez Perce.
Illinois. Frederick B. Noyes, Stewart bldg., Chicago.
Indiana. Fred. R. Henshaw, Middletown.
Indian Territory. J. M. Staples, Atoka.
Iowa. F. T. Breene, Iowa City.
Kansas. F. C. Corey, Council Grove.
Kentucky. A. B. Dixon, Glasgow.
Louisiana. C. Victor Vignes, Macheca bldg., New Orleans.
Maine. Will S. Payson, Castine.
Maryland. W. C. Foster, 9 West Franklin st., Baltimore.
Massachusetts. Waldo E. Boardman, 419 Boylston st., Boston.
Michigan. Albert L. LeGro, 271 Woodward ave., Detroit.
Minnesota. James E. Weirick, St. Paul.
Mississippi. A. E. Tillman, Vicksburg.
Missouri. D. O. M. Le Cron, Mo. Trust bldg., St. Louis.
Montana. T. M. Hampton, Helena.
New Jersey. Alphonso Irwin, Camden.
Nebraska. E. H. Bruening, Omaha.
New Hampshire. H. P. Baldwin, Manchester.
New York. H. Clay Ferris, 1166 Dean St., Brooklyn.
North Carolina. C. A. Bland, Charlotte.
Ohio. L. P. Bethel, Columbus.
Oklahoma. G. L. White, Oklahoma City.
Oregon. George H. Nottage, Portland.
Pennsylvania. Howard E. Roberts, 1517 Locust st., Philadelphia.
Rhode Island. Albert L. Midgley, 312 Butler Exchange, Providence.
South Carolina. L. P. Dotterer, Charleston.
South Dakota. G. W. Collins, Vermillion.
Tennessee. Justin D. Towner, Memphis.
Texas. Rufus W. Carroll, Beaumont.
Utah. W. G. Dalrymple, Ogden.
Vermont. K. L. Cleaves, Montpelier.
Virginia. Wm. Pilcher, Petersburg.
Washington. F. J. Shaw, Burke block, Seattle.
West Virginia. Chas. H. Bartlett, Parkersburg.
Wisconsin. W. H. Mueller, Madison.
Mexico. Ricardo Figueroa, 1 Calle de Santo Domingo 8, City of Mexico.
Canada. Theodore C. Trigger, St. Thomas, Ontario.
Hawaii. E. L. Hutchinson, Honolulu.

UNIVERSITY OF PENNSYLVANIA, DENTAL DEPARTMENT.

CLASS OF 1902.

THE fifth annual reunion of the class of 1902, Dental Department of the University of Pennsylvania, will be held on Alumni Day, Saturday, June 15, 1907. All are earnestly requested to make an effort to come back to their alma mater on that day.

J. ARTHUR STANDEN, *Sec'y*,
 1220 Locust st., Philadelphia. Pa.

UNIVERSITY OF PENNSYLVANIA.

DENTAL ALUMNI SOCIETY.

THE twenty-seventh annual meeting of the Dental Alumni Society of the University of Pennsylvania will be held in Philadelphia, June 15, 17, and 18, 1907. This will be an extremely interesting meeting, the number of clinics and social features being unusually large.

PROGRAM.

Saturday, June 15th—3 P.M. Aquatic sports in the gymnasium pool: races, water-polo, and fancy swimming.

4 P.M. "Varsity" baseball team vs. graduates, Franklin Field; admission free.

6 P.M. Alumni supper, Weightman Hall gymnasium.

7.45 P.M. Annual business meeting, General Alumni Society, Weightman Hall.

8 P.M. Reception to wives of alumni, Houston Hall and adjoining campus.

8.30 P.M. Reunion of classes in the dormitory triangle and lighting of the Bonfire. Special quarters for alumni of the dental department.

Monday, June 17th—10 A.M. Clinics and demonstrations, Dental Hall, both morning and afternoon.

7 P.M. The twenty-seventh anniversary banquet, Dental Alumni Society, at the Bartram.

Tuesday, June 18th—10 A.M. Annual business meeting, Dental Hall.

2 P.M. University grounds and buildings open for inspection.

There will be special rates on all railroads. For further information, address,

VICTOR COCHRAN, *Sec'y*,
 1628 N. Seventeenth st., Phila.

NORTH CAROLINA DENTAL SOCIETY.

THE North Carolina Dental Society will meet at Morehead City, N. C., June 26, 27, and 28, 1907.

R. H. JONES, *Sec'y*,
Winston, N. C.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its meeting in the city of San Antonio, June 13, 14, and 15, 1907.

G. W. STAPLES, *Sec'y*, Dallas, Tex.

NEW HAMPSHIRE DENTAL SOCIETY.

THE annual meeting of the New Hampshire Dental Society will be held at Plymouth, N. H., June 25, 26, and 27, 1907, beginning on the evening of the 25th. All members of the profession are cordially invited to be present.

FRED F. FISHER, *Sec'y*, Manchester, N. H.

MISSOURI STATE DENTAL ASSOCIATION.

THE next annual meeting of the Missouri State Dental Association will convene in Kansas City, Mo., June 4, 5, and 6, 1907. A most interesting and profitable meeting is anticipated. All ethical members of the profession are cordially invited to attend.

E. P. DAMERON, *Cor. Sec'y*,
St. Louis, Mo.

COLORADO STATE DENTAL SOCIETY.

THE annual meeting of the Colorado State Dental Society will be held at Colorado Springs, June 20, 21, and 22, 1907. A good program is being arranged and a profitable meeting is assured. An invitation to attend is extended to all ethical dentists, and special efforts will be put forth to make it pleasant for visitors from other states.

The undersigned would be pleased to hear from any who may plan to attend the meeting.

I. C. BROWNLEE, *Ch'm Exec. Com.*,
404 California bldg., Denver, Colo.

UTAH STATE DENTAL SOCIETY.

THE annual meeting of the Utah State Dental Society will be held at Salt Lake City, June 7 and 8, 1907. The committees are working hard to make this a fine meeting, and all ethical dentists are cordially invited to attend.

J. R. ANDERSON, *Sec'y*,
Salt Lake City, Utah.

MASSACHUSETTS DENTAL SOCIETY.

THE forty-third annual meeting of the Massachusetts Dental Society will be held in the Mechanic Association bldg., Huntington ave., Boston, Mass., June 5, 6, and 7, 1907.

An excellent program has been arranged by the Executive Committee. It will consist of essays, reports of special committees, clinics, and a large exhibit of dental and medical supplies. Special committees will report on the following interesting subjects: Tuberculosis and other preventable diseases, dental education, dental supplies, dental medicine, dental research, and dental hospitals. Gentlemen practicing dentistry in Massachusetts are invited to join the society.

CHARLES W. RODGERS, *Sec'y*,
165 Howard st., Dorchester, Mass.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, and 13, 1907. The Executive Committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, *Sec'y*,
Indianapolis, Ind.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing 10 A.M. July 17th and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, at the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st.

Prominent dentists have signified their in-

tention of reading papers, and the clinics will all be of a new and novel nature. Clinic committee in charge of Charles H. Diltz, Trenton, N. J.; exhibit committee in charge of Walter Woolsey, Elizabeth, N. J. Programs will be out June 15th.

Last year over eight hundred dentists registered in attendance. The Auditorium where the meeting is held is the largest and best adapted building on the Jersey coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its thirty-ninth annual meeting on July 9, 10, and 11, 1907, at the Schenley Hotel, Pittsburgh, Pa.

LUTHER M. WEAVER, *Sec'y*,
Philadelphia, Pa.

MAINE DENTAL SOCIETY.

THE forty-second annual meeting of the Maine Dental Society will be held at Rockland, Me., July 16, 17, and 18, 1907.

H. A. KELLEY, *Sec'y*,
609 Congress st., Portland, Me.

TENNESSEE STATE DENTAL ASSOCIATION.

CHANGE IN DATE OF MEETING.

THE fortieth annual meeting of the Tennessee State Dental Association will be held at Knoxville, Tenn., July 8, 9, and 10, 1907. All are cordially invited. Reduced railroad rates will be secured, and a successful meeting is anticipated.

R. J. MCGAVOCK, *Sec'y*,
Columbia, Tenn.

RANDOLPH (MO.) DENTAL SOCIETY.

THE dentists of Moberly, Randolph county, Mo., have formed themselves into what is to be known as the Randolph Dental Society. Dr. J. T. Fry was elected president and Dr. J. F. McClellan vice-president.

E. E. TYDINGS, *Sec'y*.

CONNECTICUT STATE DENTAL ASSOCIATION.

AT the forty-third annual convention of the Connecticut State Dental Association, held at New London, April 16 and 17, 1907, the following officers were elected: F. Hind-sley, Bridgeport, president; W. O. Beecher, Waterbury, vice-president; E. S. Rosenbluth, Bridgeport, secretary; A. E. Carey, Hartford, assistant secretary; F. W. Brown, New Haven, treasurer. Executive Committee—F. T. Murlless, Jr., Windsor Locks, F. J. Erbe, Waterbury, and W. V. Lyon, Bridgeport.

E. S. ROSENBLUTH, *Sec'y*,
1051 Main St., Bridgeport, Conn.

VIRGINIA STATE DENTAL ASSOCIATION.

THE Virginia State Dental Association will hold its annual meeting September 9, 1907, at the Inside Inn, Jamestown Exposition. There will be only a short session, as the activities of our members are being merged with those of the Jamestown Dental Convention. This will be strictly a business meeting; no committees will be appointed, and no work done other than certain important matters of business, which will be designated later in a circular letter to be issued to each member.

W. H. PEARSON, *Asst. Cor. Sec'y*,
Hampton, Va.

ILLINOIS BOARD OF EXAMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn sts., beginning Monday, June 3, 1907, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college.

school, or dental department of a reputable university, or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license.

Address all communications to

J. G. REID, *Sec'y*,
1204 Trude bldg., Chicago, Ill.

IOWA BOARD OF EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, June 6, 7, 8, 10, and 11, 1907. Applicant must hold a diploma from a college on the accredited list of the National Association of Dental Examiners, and must state where he attended first, second, and third years of college. Address

E. D. BROWER, *Sec'y*, Le Mars, Iowa.

KENTUCKY BOARD OF EXAMINERS.

THE Kentucky State Board of Dental Examiners will meet for the examination of applicants at Louisville, Ky., June 4, 1907, at The Masonic, commencing at 9 A.M.

Each applicant for examination shall be required to deposit with the secretary of the board his or her recent photograph, with signature on the reverse side, both of which shall be certified to by the dean of his or her graduating college, or other parties acceptable to the board. Applicants must be graduates of reputable dental colleges.

Every applicant shall be required to treat two or more teeth affected with pyorrhea; to insert two gold fillings; two amalgam fillings; impression, bite, and articulating teeth of upper and lower denture; one bridge on model, consisting of one shell and one Richmond crown and two porcelain-face dummies; one

gold or porcelain inlay or Logan crown, one practical case diagnosis; all to be done before the board. A general average of 75 per cent. is required. Applicants will be graded upon a basis of 60 per cent. on practical work and 40 per cent. on theory.

Applicants must come prepared with instruments, engine and material, excepting bellows, blowpipe, lathe, stones, and polishing cones, to do the above-mentioned work.

The board would advise the use of gold in the above bridge, as it would cost very little more than German silver after disposing of it.

Application for examination must be made upon blanks furnished by the board, and must be accompanied by a fee of \$20.00.

J. RICHARD WALLACE, *President*,
The Masonic, Louisville, Ky.

MINNESOTA BOARD OF EXAMINERS.

THE Minnesota State Board of Dental Examiners will hold a special meeting at the dental building of the state university, in Minneapolis, June 6, 7, and 8, 1907. All applications must be in the hands of the secretary by 10 o'clock June 6th, as examinations will begin at 10.30 o'clock sharp. All blanks, paper, and patients supplied by the board. Operating instruments, etc., must be brought by the applicant. Any further information will be given by addressing

Geo. S. TODD, *Sec'y*, Lake City, Minn.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE next examination of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning at three o'clock June 6, 1907, and continuing three days. All candidates are required to bring operating instruments, including dental engine, and such other appliances and materials as are necessary to do crown and bridge work. All applications, together with the fee, ten dollars, must positively be in the hands of the secretary by June 3d, and no application will be considered thereafter.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examination of applicants for registration will be held in Manchester, N. H., June 11 to 13, 1907.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

INDIANA BOARD OF EXAMINERS.

THE next regular meeting of the Indiana State Board of Dental Examiners will be held in the Capitol at Indianapolis, June 11, 12, and 13, 1907. Applications must be in the hands of the secretary at least five days before the above date. Address

F. R. HENSHAW, *Sec'y*,
Middletown, Indiana.

WEST VIRGINIA BOARD OF EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold their next meeting for the examination of candidates at Wheeling, W. Va., June 12, 13, and 14, 1907. For further information address

H. M. VAN VOORHIS, *Sec'y*,
Morgantown, W. Va.

PENNSYLVANIA BOARD OF EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 12 to 15, 1907. For application papers and full particulars address the secretary of the Dental Council.

N. C. SCHAEFFER,
Harrisburg, Pa.

WISCONSIN BOARD OF EXAMINERS.

THE next meeting of the Wisconsin Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held Monday, June 10, 1907, at the Wisconsin College of Physicians and Surgeons, Milwaukee, Wis.

Application must be made to the secretary

fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or have been an apprentice to a reputable dentist for five years.

For further particulars apply to

J. J. WRIGHT, *Sec'y*,
1218 Wells bldg., Milwaukee, Wis.

TEXAS BOARD OF EXAMINERS.

THE Texas State Board of Dental Examiners will hold their next regular meeting at San Antonio, Texas, June 10, 1907, at 10 A.M. For further information address

C. C. WEAVER, *Sec'y*,
Hillsboro, Texas.

VIRGINIA BOARD OF EXAMINERS.

THE next meeting of the Virginia State Board of Dental Examiners will be held at the Medical College of Virginia, Richmond, Va., beginning at 9 A.M. Tuesday, June 11, 1907.

R. H. WALKER, *Sec'y*, Norfolk, Va.

CALIFORNIA BOARD OF EXAMINERS.

THE next examination of the California Board of Dental Examiners will be held in Los Angeles beginning June 10, and in San Francisco beginning June 17, 1907.

C. A. HERRICK, *Sec'y*,
Jackson, Cal.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday, and Saturday, June 13, 14, and 15, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

Applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before June 6, 1907. By order of Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

OHIO BOARD OF EXAMINERS.

THE regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio will be held in Columbus, June 25, 26, and 27, 1907. Only graduates are eligible to examination. Application, accompanied by fee (\$20.00), should be filed with the secretary by June 15th. For further information address

H. C. BROWN, *Sec'y*,
185 E. State st., Columbus, Ohio.

SOUTH CAROLINA BOARD OF EXAMINERS.

THE South Carolina Board of Dental Examiners will meet in annual session at Anderson, S. C., on June 28, 1907, to examine applicants for license. For further information address

BROOKS RUTLEDGE, *Sec'y*,
Florence, S. C.

WYOMING BOARD OF EXAMINERS.

THE Wyoming State Board of Dental Examiners will meet in Sheridan, Wyo., on July 1, 2, and 3, 1907, for the examination of candidates. All applications, together with a fee of \$25.00, must be in the hands of the secretary not later than June 25th.

For further information and application blanks address

PETER APPEL, JR., *Sec'y*,
P. O. Box 643, Cheyenne, Wyo.

FLORIDA BOARD OF EXAMINERS.

THE Florida State Board of Dental Examiners will meet June 3, 1907, at 10 o'clock, in Jacksonville, Fla., for the purpose of examining applicants for license to practice in this state.

Applicants must furnish instruments in practical work, and in addition to the written examination will be required to put in one gold filling, one alloy filling, and to solder and finish one four-tooth bridge under supervision of the board. Bring bridge ready for investing. Only graduates of reputable dental schools are admitted to examination.

W. G. MASON, *Sec'y*,
Tampa, Fla.

NORTH CAROLINA BOARD OF EXAMINERS.

THE next meeting of the North Carolina Board of Dental Examiners will be held at Morehead City, N. C., June 24, 25, and 26, 1907. Applicants must register on or before 9 A.M. June 24th.

For further information address

R. H. JONES, *Sec'y*, Winston-Salem, N. C.

VERMONT BOARD OF EXAMINERS.

A MEETING of the Vermont State Board of Dental Examiners for the examination of candidates will be held at the State-house, Montpelier, Vt., Monday, Tuesday, and Wednesday, July 1, 2, and 3, 1907, commencing at 2 o'clock of July 1st. All applications, together with the fee, \$25.00, must be in the hands of the secretary not later than June 23d. Application blanks and further information may be obtained from

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vt.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners of the District of Columbia will take place July 1, 2, and 3, 1907. All applications must be accompanied with a fee of ten dollars, and should be filed not later than June 22d with

WM. B. DALY, *Sec'y*,
1340 New York ave. N. W., Washington, D. C.

MAINE BOARD OF EXAMINERS.

THE next regular meeting of the Maine Board of Dental Examiners will be held at Portland, Me., beginning on Monday, July 8, 1907, at 2 P.M.

DANA W. FELLOWS, *Sec'y*, Portland, Me.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Tuesday, Wednesday, and Thursday, July 9, 10, and 11, 1907. Application blanks and particulars may be obtained of

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

ARMY DENTAL CORPS.

CONTRACT Dental Surg. Samuel W. Hussey, now on temporary duty at Camp Daraga, Albay, will proceed to Camp McGrath, Batangas, for duty. (Jan. 25, D. Luzon.)

Contract Surg. Thomas S. Lowe will proceed to Camp Bumpus, Leyte, for duty. (Jan. 24, D. V.)

Dental Surg. William H. Chambers from Philippines, May 15, to San Francisco. (March 12, W. D.)

Dental Surg. William H. Chambers is granted leave for one month and ten days, with permission to visit China and Japan, effective on or about April 15, 1907. (Feb. 7, Phil. D.)

Dental Surg. George. I. Gunkel, having reported his arrival in San Francisco, Cal., will proceed to Fort McPherson, Ga., for duty, and by letter to the commanding general, Department of the Gulf, relieving Dental Surg. George L. Mason, who will proceed to San Francisco, and take the first available trans-

port for assignment to duty. (March 21, W. D.)

Dental Surg. Raymond E. Ingalls will proceed from Los Angeles to Fort Leavenworth, for duty. (March 27, W. D.)

Dental Surg. Ord M. Sorber is granted leave for two months, to take effect upon his relief from duty in the Philippines Division, and he is authorized to visit Japan. (March 29, W. D.)

Dental Surg. Hugh G. Voorhees from Philippines to United States. (March 12, W. D.)

Dental Surg. Hugh G. Voorhees will be transferred, by the first available transport leaving Manila, to San Francisco for admission to the Army General Hospital for treatment. (March 11, Phil. D.)

Contract Dental Surg. Croxton L. Rion will proceed to his proper station, Camp Jossma, Guimaras, for duty. (March 1, D. V.)

Contract Dental Surg. Douglas E. Foster, Camp Campbell, Samar, to Warwick Barracks, Cebu, for duty. (March 9, D. V.)

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1907.

April 2.

- No. 848,863, to I. STEEN. Reinforce and backing for artificial teeth.
 No. 849,208, to L. H. CRAWFORD. Dental handpiece.
 No. 849,209, to L. H. CRAWFORD. Combined mouth-mirror and lamp.
 No. 849,297, to G. J. WEBER. Dental swaging device.
 No. 849,335, to L. MARKWITZ. Electric dental furnace.

April 9.

- No. 849,702, to CHAS. A. SEVIER. Guard and moistener for dental tools.

April 16.

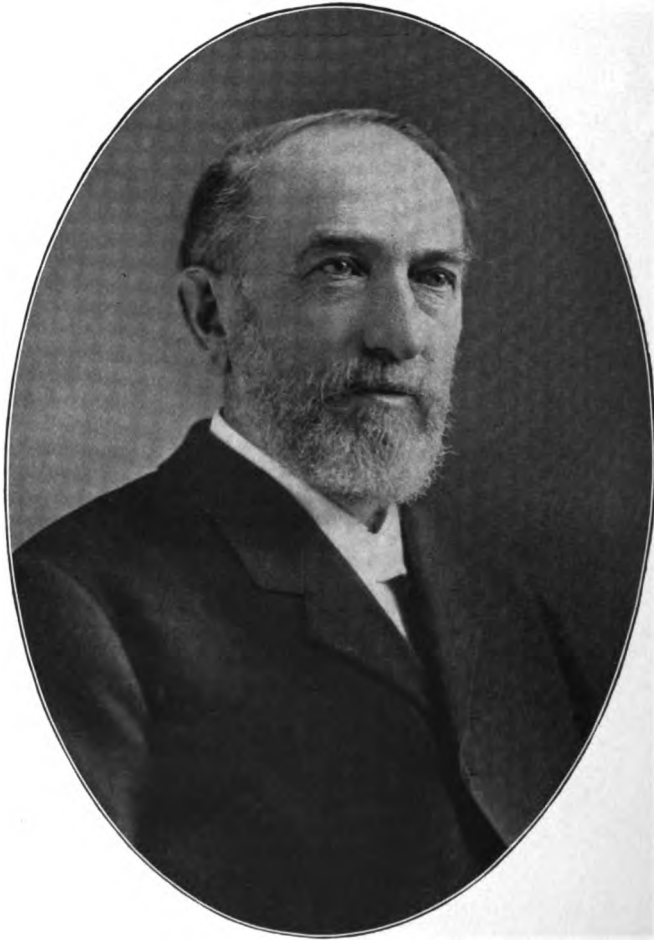
- No. 850,661, to J. A. LEWIS. Dental engine.

April 23.

- No. 851,483, to G. BARTLETT. Moistening attachment for dental engines.
 No. 851,501, to E. L. DETRICK. Tooth-brush.
 No. 851,550, to J. C. NEVIUS. Tooth-brush guard.
 No. 851,578, to W. O. WEST. Artificial teeth.

April 30.

- No. 851,735, to C. M. DOWELL. Dental appliance.
 No. 852,159, to J. BODE. Dental tool handle.
 No. 852,266, to E. DE W. R. GARDEN. Artificial tooth.



DR. J. BOND LITTIG.

THE DENTAL COSMOS.

VOL. XLIX.

JULY 1907.

No. 7.

ORIGINAL COMMUNICATIONS.

FURTHER INVESTIGATIONS OF THE SUBJECT OF WASTING.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Ger.

I. THE AMPHOTERIC REACTION.

IN the April issue of this journal a letter will be found addressed by Dr. Head to the Editor, under the heading "Dr. Miller's Litmus Test," in which the question of the reliability of the litmus test in connection with studies on the subject of wasting is called in question. The Editor in replying confirms the doubts expressed by Dr. Head, and emphasizes the necessity of adopting other means to determine the acidity of the saliva, and thus learn whether it may be the fact in any given case that although the saliva may turn red litmus paper blue, there may nevertheless be acid salts present which are chemically capable of acting upon enamel detrimentally.

The title "Dr. Miller's litmus test" is misleading, since I have no particular litmus test, but made use of the test as ordinarily employed in chemical laboratories.

I am glad to find the results of Dr. Head's experiments coincide fairly well with mine, and I regret that his publication in the *Dental Brief* to which he refers escaped my notice at the time. I may here also call attention to the "Warning" of Dr. Goodwin (*Dental Digest*, 1905, p. 1275). Dr. Head says, "In addition to this (the mechanical agent) it seemed probable that there might be a chemical cause also in some cases." He suggests the acid calcium phosphate in his article in the *Dental Brief*. I have, however, gone farther than this, and admit the action of *any acid* in the mouth which is capable of attacking the enamel. Furthermore, I have found (see *Cosmos* for March, p. 242) that certain acids, especially oxalic and to a less extent mucic, and as I have more recently observed, *possibly to a slight extent* the acid phosphates, seem to have under certain conditions the power of making dentin "brittle and rotten" (*Cosmos*, p. 242),

and of thereby accelerating the process of wasting even in the dentin. Especially, however, in those cases where the erosion extends freely upon the enamel surface, I recognize the accelerating effect of any acid action. (February Cosmos, pp. 123, 124, etc.)

We have to suspect acids—as I have clearly pointed out in my series of articles—especially in cases where the wasting extends rapidly upon the enamel, where the enamel wears down faster than fillings of gold or amalgam, and where the enamel has a dull or pitted surface; and naturally, of course, where there is other evidence of decalcifying action on the enamel.

I call particular attention to this fact here, as Dr. Head seems to have gained the impression that I give no credit to acids in any case.

I recognize the importance of the point brought out by Dr. Head and Dr. Kirk regarding the amphoteric reaction as far as the acid and the dibasic sodium phosphates are concerned, and supposing these two bodies to be the only or even the chief causes of both the acid and the alkaline reaction of the oral fluids, it demands our strictest attention. But, even granted that this be the case, I do not see how this fact could seriously affect the validity of my conclusions. In the first place, because they are based more upon other criteria than upon the mere reaction of the saliva.* In the second place, I have found, and have in my communication given due credit to, an acid reaction of the mucus in the majority of the cases I have examined. Thirdly, I recognized the presence of the amphoteric reaction of the saliva in a given percentage of the cases, while in the majority it was alkaline; and I doubt whether the acid phosphate which is present in such small quantities as to be

completely obscured in the litmus test would be sufficiently strong to injure the teeth.

It is chiefly for another reason, however, that the tests of the saliva do not seem to me to be of paramount importance in connection with the investigations which I have made; that is, because we can hardly make a general condition of the saliva, whether acid or alkaline, responsible for the localized manifestations as we find them in ordinary cases of wasting. A study of Dr. Kirk's article entitled "The Clinical and Chemical Study of a Case of Dental Erosion" (*Items of Interest*, March 1902) will show that he is of the same opinion. The manner in which a *general acid condition* of the oral fluids affects the teeth is likewise brought out in Dr. Kirk's article. He writes: "All the surfaces of the teeth in every direction were undergoing solution, giving evidence that the erosion was due to general oral acidity and not to localized acidity." And again: "When I applied an excavator it was like cutting into the texture of an old, decayed cork, and the instrument penetrated a considerable distance before solid structure was reached." Had the general acid condition been brought about by oxalic acid instead of lactic we should have seen other results, but still probably all of the teeth would have been more or less affected. All of the cases which I have examined (with a few exceptions) have been cases of *localized* wasting, as will appear from a study of my communication, and I here again agree with Dr. Kirk that localized cases are produced by localized agents.

While I am, therefore, perfectly willing to admit that tests of the saliva made by litmus may not always be reliable, I do not see how a stricter observance of this fact could have materially modified the results of my investigations, since I was not dealing with general but with local defects, in which the general condition of the saliva is not of primary importance.

I am very much indebted to Drs. Head and Kirk for having called my attention to this point. It is a question, however,

* These criteria are, in cases of simple abrasion: (1) The absence of all signs of acid action. (2) The absence of any general disorder or diathesis. (3) The vigorous use of the tooth-brush, usually in conjunction with a sharp powder. (4) The marked wearing of fillings of amalgam and gold; etc. (See Cosmos for January, February, and March.)

which cannot be answered by theoretical deductions, and I beg to submit the following experiments relating to it.

Experiments.

The question to be solved was this:

If we add the dibasic sodium phosphate to a solution of the acid sodium phosphate or of the acid calcium phosphate until the solution turns red litmus paper blue, or until the reaction of the acid salts is obscured, do these salts still retain their action upon the tissues of the tooth?

The following experiments were made bearing upon this question:

Experiment I. A 10 per cent. solution of the acid sodium phosphate was divided into two parts, A and B, and to B powdered dibasic sodium phosphate was added until the solution changed the color of red litmus paper to blue, at the same time giving a delicate pink tinge to blue litmus. Ground sections from the same tooth were now dropped into the solutions. In 5 hours the sections in A showed beginning decalcification, the dentin taking on a bright red stain in a watery solution of eosin. The section in B showed no change whatever.

In 2 days the dentin of the sections in A was completely decalcified, and the enamel on drying appeared opaque. The sections in B were still unchanged, as likewise was the case after 5 days. At this time a crystalline precipitate had formed in B, and the liquid produced a spot of delicate pink color on blue litmus paper. After 3 weeks there was no apparent action on the sections in B, the solution having been repeatedly renewed. Even sections that were microscopically thin showed no decalcification whatever.

Experiment II. The same experiment as I, but carried out with 5 per cent. solutions. The sections in A, tested after 20 hours, took up the eosin or picrofuchsin stain very readily, in B not at all. After 4 days even the thinnest section in B was still absolutely unchanged. The solution tinged blue litmus a delicate pink, and red litmus a dirty blue.

Experiment III. One gram of the monobasic calcium phosphate was added to 50 ccm. of warm water (a small quantity remained undissolved). Of this, 5 ccm. was brought into a test tube (A), and the 10 ccm. was made amphoteric by the addition of powdered dibasic sodium phosphate (Na_2HPO_4). A precipitate was formed and allowed to settle

to the bottom; then 5 ccm. of the supernatant liquid was poured off; this formed the portion B, and the 5 ccm. remaining in the tube the portion C. A was acid, B and C amphoteric.

Ground sections of teeth were now added to all three solutions. In 1 hour the sections in A very readily took on the stain; in B and C not at all.

In 6 hours sections in A stained intensely; in B and C again not in the least. In 2 days sections in A softened, enamel being superficially decalcified; in B and C there was no change—even in the case of a very thin section with sharp, fine points.

In 4 days the same result was found, although the solutions B and C gave a slight reddish color to blue litmus.

Experiment IV. A 1 per cent. solution of acid calcium phosphate, A; the same with addition of dibasic sodium phosphate, B. Sections in A showed beginning decalcification in 8 hours; in B, after 3 days, just a possible faint tinge of pink on treatment with eosin.

Experiment V. A 5 per cent. solution of phosphoric acid, A; the same made amphoteric by addition of dibasic sodium phosphate, B; the latter plus enough phosphoric acid to make the reaction very slightly acid, C. In $\frac{1}{2}$ hour sections in A took on a deep red stain in eosin; sections in B and C showed no change.

In 2 hours sections in A were completely decalcified; in B no change; in C possibly a very slight beginning of decalcification.

Experiment VI. Saliva saturated with acid calcium phosphate, A; the same plus dibasic sodium phosphate, B, the reaction being made hardly amphoteric, the blue litmus showing distinct reddening and the red scarcely blue. In 40 minutes sections in A were found readily stainable; in B not at all. In 24 hours the result was the same.

Experiment VII. Into each of five test tubes A, B, C, D, E, 6 ccm. of a 5 per cent. solution of the acid sodium phosphate was introduced. The solution in A was left unaltered; to B, added 140 mgm. di-sodium phosphate, to C 280 mgm., to D 420 mgm., and to E 560 mgm. of the same salt. E was amphoteric, the others all acid, the acidity increasing from D to A. To all, sections of ivory and of human teeth were added. In 5 hours there was very apparent decalcification of the sections in A, markedly less in B, a trace only in C, and none in D and E. In 15 hours sections in A became bright red; on treatment with eosin those in B, C, and D had only a very faint pink tinge, and all about alike; in E there was no change.

Experiment VIII. A concentrated solution of acid calcium phosphate was prepared in 25 ccm. of saliva and divided into 5 portions (A, B, C, D, E); A was left unchanged, to B was added 300 mgm., to C 600 mgm., to D 900 mgm., and to E 1200 mgm., of the dibasic sodium phosphate. In 40 minutes the section in A showed bright red to eosin test, in B considerably less color, in C but slight rose color, in D and E no change.

In 5 hours the enamel in A appeared chalky on the ground surface, in B it lacked the chalky appearance, in C there was no change in the enamel and almost none in the dentin, although the reaction of this solution was still distinctly acid; in D and E there was no change, D was amphoteric with predominance of acid, E amphoteric with predominance of alkali.

In 3 days the enamel of the sections in A crumbled under the excavator; in B it was likewise disintegrated, but to a less extent; in C there was scarcely a trace of action on either enamel or dentin, the latter assuming only a slight pinkish tinge on treatment with eosin, although the reaction was distinctly more acid than amphoteric.

Experiment IX. A 5 per cent. solution of acid sodium phosphate in distilled water was divided into two equal portions, and one was made amphoteric by addition of the dibasic phosphate in substance; 0.5 gm. of powdered calcium phosphate was now added to each portion, and the portions (in identical flasks) were repeatedly shaken during a space of two hours. A part of the acid portion being filtered gave a fairly strong precipitate with oxalate of ammonia; the amphoteric portion remained absolutely clear on addition of the reagent.

Experiment X. One liter of a 10 per cent. solution of monobasic sodium phosphate was neutralized (made amphoteric) by the acid phosphate, and powdered calcium phosphate, $\text{Ca}_3(\text{PO}_4)_2$, added. This was shaken for 5 hours at 26°C ., when 3 mgm. of the calcium salt was dissolved—i.e. the solubility of the calcium phosphate in the given solution is 1:333,000. This experiment was made in the chemical laboratory of the University of Berlin, under the direction of Professor Fischer.

My time does not allow me to carry out any further experiments at present, but I think that from the results recorded above we must draw the conclusion that the dibasic sodium phosphate exerts a profound influence upon the action of acids as well as of acid salts (sodium and calcium included). In all of

the experiments thus far made, amphoteric solutions have been either devoid of action or at most have shown only a possible trace. Even the thinnest sections in solution B of experiments I and II showed no change after three weeks, the solution having been renewed every three to four days.

In these experiments I have usually reduced the acidity of the solutions till they turned red litmus a dirty grayish blue and gave a slight pink color to blue litmus, i.e. until the acid was nearly but not quite obscured to the litmus test. In some cases—which I have particularly noted—the acid predominated sufficiently over the alkali to color blue litmus red, and red only faintly blue. In such cases we would naturally expect a certain amount of decalcification if the experiment were carried on long enough, but I have been surprised to see how very slowly even these solutions act.

I shall take up the question again when I am in a position to do so. Possibly under other conditions one may be able to obtain more action than has hitherto appeared.

II. ON DEFECTS IN THE TEETH OF ANIMALS RESEMBLING WASTING IN HUMAN TEETH.

Casual reference has been made by different writers to the fact that a loss of substance may occur in the teeth of animals which presents great similarity to the defects of the human teeth designated as “abrasion” or “chemico-abrasion.”

In particular the case reported by Murie (*Trans. Odontological Society of Great Britain*, 1870, vol. lxi, lxx) has excited much comment. In this case marked defects very much resembling wasting were present in the teeth of a specimen of sea-lion (*Otaria jubata*) in the museum of the Royal College of Surgeons in London. The illustration accompanying the communication of Murie is reproduced in Fig. 1.

I was not able to find this specimen in the collection referred to, but was much interested in the examination of a

FIG. 1.



Defects resembling wasting in the teeth of a sea-lion (*Otaria jubata*). (After Murie.)

skull of *Otaria Stelleri* in the same museum, which shows defects very similar

tion of mastication, but some of them show loss of substance strikingly similar to that which goes under the name of abrasion in places where wear by the ordinary process of mastication appears to be excluded. The upper right canine has an extensive shallow excavation on the disto-labial surface, the upper left third incisor has a deep approximately wedge-shaped defect on the labial surface extending upon the distal, and the upper right first premolar a small concave facet on the distal surface. These defects are fairly smooth but lack the high polish often present in human teeth, and the examination with a strong lens shows that the surface is covered with fine scratch-marks which in the most of the teeth affected do not seem to run in any one direction more than another.

The presence of these scratches seems to indicate the mechanical action of some very sharp substance or substances on the teeth. Sea-lions live, it is known, upon fish, sea-fowls, echino-

FIG. 2.



Right maxilla of *Manichus tropicalis*, with remarkable defect on distal surface of canine. (South Kensington Museum, No. 87.8.1.5.) (S. P. Mummery del.)

o those described by Murie and shown in his illustration. In this case the teeth are not only very much worn by the ac-

derms, mollusks, etc., cracking the shells of the latter with their teeth. Besides this, they always take a few pebbles or

stones along with their food, and according to some authors, sand, and these facts seem to furnish a sufficient explanation for the marked wearing referred to. Lecomte states, in the "Royal Natural History," that in the stomach of every sea-lion he has examined, with the single exception of a young animal, there was found a quantity of pebbles.

In the South Kensington Museum I ran across a skull of *Manichus tropicalis* (No. 87.8.1.5) in which the powerfully developed upper right canine shows a marked excavation on the distal surface about at the level of the gums. (Fig. 2.) The upper left canine has a similar defect, but much shallower. The defects in this specimen also show irregular scratches on the surface having chiefly a horizontal direction. I have endeavored to account for those defects on the supposition that the animal used his teeth for tearing up seaweeds, and that these, possibly charged with sand, being drawn across the surface of the tooth would in the course of time produce the excavation shown.

It must be taken into consideration in this connection that animals, both wild and in captivity, contract strange habits which might account for some of the tooth-defects which are to us otherwise inexplicable. In Fig. 3 I have reproduced an illustration from a communication by Professor Kitt of Munich on "Anomalieen der Zähne unserer Haustiere," (*Verhandl. der Deutschen Odontologischen Gesellschaft*, Bd. iii, S. 109).

We see here the lower front teeth of a horse, with extensive abrasions entailing an almost total loss of the enamel of the labial surface. It is well known that these defects are the result of a habit of some horses called in Germany *Krippenwetzer* (crib-whetters), of rubbing their teeth on the edge of the manger, or on iron bars, or whatever of this nature they may reach. The action is quite different from that of the cribbers or crib-biters that grasp the object between the cutting edges of the teeth.

I am indebted to Dr. Rygge of Christiania for some twenty teeth of *Globicephalus globiceps*, a species of dolphin known as the "Grindwal," which attains

a length of 6 or 7 meters and has 8 to 12 conical and mostly more or less curved teeth on each side of the jaw above and below. A number of the teeth sent me by

FIG. 3.



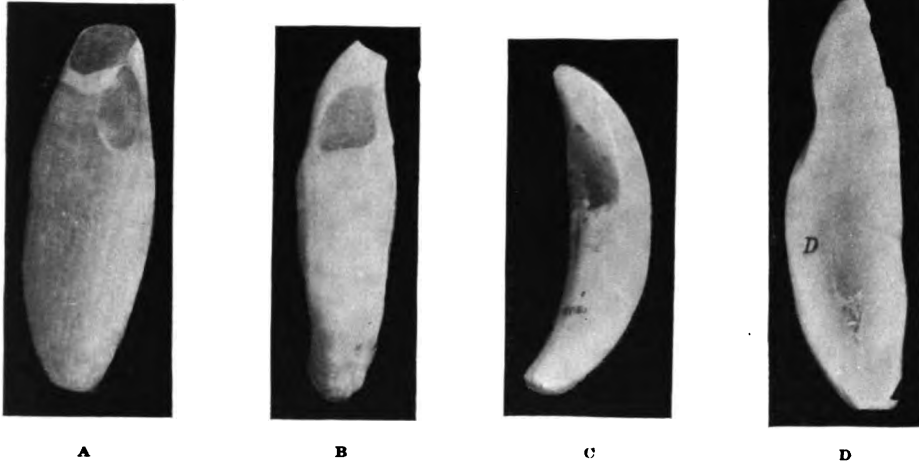
Defect of the labial surfaces of the lower incisors of a horse, resembling wasting, produced by the habit designated as "cribbing" or "whetting." (After Kitt.)

Dr. Rygge have beautiful smooth defects (Fig. 4) which are very puzzling until one has examined the manner of articulation of the teeth of this group of cetacea. It will then be plain to us that such defects are nothing but facets worn by the friction of the teeth with their antagonists. In *Globicephalus* the teeth are implanted in alveoli and the distance between any two teeth is about equal to the largest diameter of the corresponding antagonist. In the upper jaw they stand almost vertically; in the lower jaw they become more and more supined from the back to the front of the row, until the foremost teeth stand out almost horizontally and the upper teeth close down between them. The position and shape of the facets will accordingly depend somewhat upon the position of the teeth—in the front or back of the jaw.

Professor Michel of Würzburg ("Keil-

förmige Defekte," *Deutsche Zahnärztl. Wochenschrift*, November 6, 1904) states deciduous canine has a narrow wedge-shaped defect which extends three-

FIG. 4.



Teeth from a dolphin (*Globicephalus globiceps*), with defects closely resembling wasting. D, Longitudinal section of one of the teeth.

that 10 to 15 per cent. of all old cattle have wedge-shaped defects. I have been able to confirm this statement of Michel's, especially with reference to the front teeth; in fact, I think one may say that in old cattle the distal surface of the canine will nearly always show more or less wear at the neck, sometimes amounting to deep excavations, as seen in Fig. 5. This remarkable case of abrasion occurs in the right canine of an ox. The specimen is found in the collection of the Dental Institute of Berlin. The incisors are much less frequently abraded, but still we occasionally meet with slight wasting, as seen in Fig. 6, a photograph of the front part of the lower jaw of an old cow (specimen in the museum of the Tierärztliche Hochschule, Berlin). We have in this case a slight cupping at the necks of some of the incisors, both on the approximal and labial surface.

A very striking case of wedge-shaped defect is seen in Fig. 7, a photograph of the right side of the lower jaw of an ox belonging to the so-called Niata race (specimen No. 3386 in the museum of the Landwirtschaftliche Hochschule, Berlin). On both sides of the jaw the

fourths of the way through the tooth. (Fig. 7, A.) Also the second incisor of the right side shows a slight cupping at

FIG. 5.



Remarkable wedge-shaped defect in the canine of an ox.

the neck on the mesial surface. (Fig. 7, B.) I can account for these remarkable defects only on the supposition that the

animal fed for a greater length of time on coarse hay or grass (possibly impregnated with sand) which being drawn across the necks of the teeth at the end of the row produced the incision between

with the gums intact. In a quarter of an hour the teeth were cut in the manner represented in Fig. 8.

When there has been much recession of the gums and the teeth stand far apart

FIG. 6.



Incisor and canine teeth of an old cow, showing slight wasting at neck; A, on approximal; B, on labial surface.

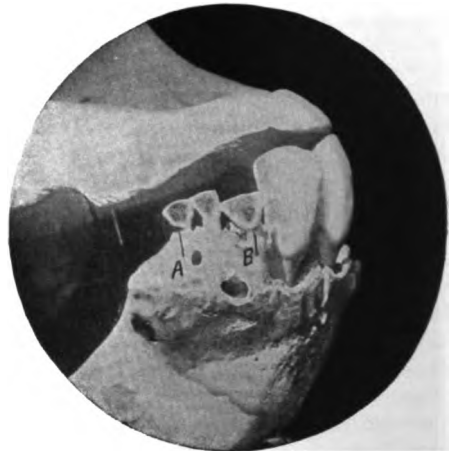
the margin of the enamel and the gums. It will be noticed that the necks of the teeth are very short, and that only a very narrow zone of dentin between the enamel margin and the gums can have been exposed to the friction of the food. The presence of a defect on the mesial surface of the right second incisor (Fig. 7, B) may, I think, rationally be accounted for by the fact that after the shedding of the central deciduous incisors the mesial surface of the second incisors became exposed until such time as the permanent centrals had grown into position.

The Niata cattle, which are found on the Serra of Rio Grande do Sul, are to be considered, according to Hensel (*Der Zoologische Garten*, 1876), not as a race, but rather as a degenerated type which is not hereditary. That which particularly characterizes these cattle is the shortened upper jaw, which produces a pug-like appearance and "makes it impossible for them to feed on any other than long grass."

I have been able to produce defects identical with those shown in Fig. 7 by drawing a bunch of fine strings impregnated with sand across the distal surface of the canines of a calf, using a fresh jaw

at the necks we may find wearing, even on the approximal surfaces of the inci-

FIG. 7.



Fore part of jaws of an ox (Niata race), showing marked wedge-shaped defect on distal surface of deciduous canine, A, and slight defect on mesial surface of deciduous second incisor, B.

sors. But this wearing, as far as my observation goes, is always slight.

It will be readily seen that in proportion as the fan-shaped crowns of the incisors wear down, the interdental spaces will become gradually wider and the cutting edges of the teeth will not form an unbroken line as they normally do. In this case, as well as where a space has been produced by

FIG. 8.



Artificial production of defects similar to those shown in Fig. 7.

any change in the relative position of a tooth, the grass which is not caught between the edge of the tooth and the gums of the upper jaw will be simply drawn through between the teeth and may produce wearing of the approximal surface. We see accordingly in Fig. 6 that the wearing on the approximal surface is confined to the first and second incisors, which stand so far apart as readily to admit of the grass, weeds, or twigs of trees being drawn between them and across their necks in grazing or browsing. This wearing is well seen at A, Fig. 6.

The incisors sometimes become very excessively worn by attrition, as shown in Fig. 9, a rough sketch of the lower first and second incisors of an Ayrshire cow, fourteen years old. The crowns of all the incisors and both canines in this specimen have disappeared entirely with

the exception of the centrals, where a small bit of the external enamel plate still remains standing.

FIG. 9.



Permanent first and second incisors of a fourteen-year-old Ayrshire cow, showing marked wearing by attrition.

In Fig. 10 I have reproduced a portion of the lower jaw of a specimen of *Bos sondiacus*, Java (No. 1271 in the museum of the Landwirtschaftliche Hochschule), in which the mesial surface

FIG. 10.



Right side lower jaw of *Bos sondiacus*, showing abrasion of mesial and lingual surfaces of first premolar.

of the first premolar on the right side has a large wedge-shaped defect. The defect extends upon the lingual surface, but appears there flatter and reaches farther toward the morsal surface of the tooth. On the left side the corresponding tooth is still more worn, and the

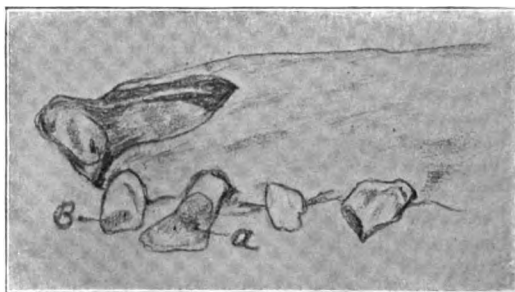
entire lingual wall with a part of the morsal surface is worn away. This result appears to be brought about by friction of the food under the pressure of the tongue during the many hours of daily grazing and chewing. This tooth, standing at the end of the row, is naturally much more exposed than the others.

It is not impossible that unusually coarse food may have been taken by the animal at some period of its life, and the

be accounted for by the fact that in the incisors of the horse the enamel extends well toward the end of the root and the dentin is not exposed at the neck, whereas the incisors of ruminants have a well-defined crown which alone is covered with enamel, the neck being bare as in the human teeth, and a slight recession of the gum exposes the cement and dentin to wear.

In two cases I found that the distal

FIG. 11.



Fore part of left upper jaw of a sow of Upper Hungary, with pronounced wasting on the labial surface of the second incisor, and slight wasting of the first.

possibility of a slight intermixture of earth or sand with the food is always present where animals graze on short grass.

At times extraordinary circumstances may play a certain rôle, as when, *e.g.*, the meadows along the creeks are overflooded and the growing grass or hay is impregnated with sand. I have known whole crops of hay to become sanded in this way.

In an examination of about forty skulls of sheep I found only one case in which there appeared to be a slight amount of wasting at the neck. I was impressed by the fact that the teeth of the sheep examined were very much less worn by attrition than those of cattle, possibly because most sheep are killed at a very early age.

In the examination of twelve mouths of living horses and seventy-five skulls I found nothing which corresponds with the wear which we find so often in the teeth of ruminants. This is probably to

wall of the upper third incisor had been worn down by the action of the lower canine.

In a number of cases the lower canine itself was worn down almost to the gum, although as a rule it does not come into contact with any antagonist in masticating, the wearing in the latter case being due to the action of the bit. Occasionally we meet with extensive wasting of the enamel due to the nervous habit of the horse of rubbing his teeth against the crib or bars of any kind, as referred to above. (Fig. 3.)

Hogs form another group of animals in which the appearances resembling wasting are frequently met with. It is here, as far as my observation goes, chiefly the facial surface of the upper incisors that is affected, and more especially of the second incisor, which is sometimes extensively worn. In one case I found also the lower second and third incisors totally denuded. In Fig. 11 we have the front part of the left

upper maxilla of a sow from Upper Hungary (museum of the Hochschule, No. 539). The facial enamel plate of the second incisor (Fig. 11, *a*) is almost totally wanting, only a narrow border remaining at the cutting edge. The defect is much less pronounced in the first incisor (Fig. 11, *b*), and the dentin is not exposed. Occasionally I have found that

tear the trees by wire netting or in some other manner to prevent their destruction. They likewise wear away their feeding-troughs by rubbing their mouths against them, in which act the second incisor would suffer most. I have frequently seen defects on the lingual surface of the lower incisors which were obviously produced by attrition, as in the

FIG. 12.



Fore part of jaw of peccary (*Dicotyles torquatus*), showing attrition of lingual surface of incisor and abrasion of mesial surface of lower canine.

nearly the whole of the crown had been worn away so that nothing but a stump remained. In the cases which I have examined it has usually been the second incisor which was most worn, which I think can be readily understood, inasmuch as this is the most prominent tooth in the front part of the mouth. I have no means of accounting for this wear except on the supposition that it is brought about by the friction of the soil in rooting, or by rubbing the teeth against hard objects after the fashion of the horse in cribbing or whetting. We know that hogs do have the habit of rubbing their mouths against the stems of trees, so that it often becomes necessary to pro-

tect the trees by wire netting or in some other manner to prevent their destruction. They likewise wear away their feeding-troughs by rubbing their mouths against them, in which act the second incisor would suffer most. I have frequently seen defects on the lingual surface of the lower incisors which were obviously produced by attrition, as in the

case represented in Fig. 12, the lower jaw of a peccary (*Dicotyles torquatus*—No. 4103), while the facet on the anterior surface of the lower canine in the same jaw has been produced by friction with the various foreign bodies with which this exposed and prominent surface must come into contact. Likewise I have observed ring-shaped wasting extending more than half way around the lower canines of an American tapir produced solely by attrition. These teeth project slightly forward, and in the action of mastication the food glides along the distal surface, wearing into the tooth at the point where the enamel ceases.

In very old dogs we sometimes find, besides a wearing down of the teeth, a shallow depression at the cervical margin of the enamel. In one case, that of *Canis pictus*, a specimen from the Zoological Garden (No. 4226, Landw. Hochschule) I noticed, besides the pronounced attrition, a possible slight wearing at the neck. On the whole, however, I have seen but very little evidence of any action resembling wasting in the teeth of dogs.

The wearing of the front teeth produced by gnawing bones may go on even after the teeth cease to come together, and result in producing an open bite.

It will be seen from the above short report that wasting of the teeth of animals is by no means a rarity; in fact, I am of the impression that it is more frequent than among those classes of human beings who give little attention to the care of the teeth. As for the cause of the wasting of the teeth of animals, the fact that it always occurs at points exposed to mechanical action and never at points which are effectively protected against such action seems to indicate plainly enough that it is due to the friction of the food pressed against the teeth by the lips or tongue in grazing and chewing, or to the wearing produced by drawing the food across the necks of the teeth in grazing or browsing; or, finally, to a habit of the animal of rubbing its teeth against hard objects. Acids can hardly come into consideration here, in view of the strong alkaline reaction of the saliva. Alkalis might be called into requisition by those who hold that wasting occurs only in the presence of substances which attack the organic matter of the teeth. But it is difficult to understand how any organ of the human body should be attacked by the secretion in which it is normally bathed.

Michel has expressed the opinion that inasmuch as the teeth of herbivorous animals show defects at the necks produced solely by the friction of food, the wedge-shaped defects of the human teeth must have the same origin. But this conclusion is obviously not well

grounded. Our food is very different in character from that of animals, nor do we spend our whole time from sunrise to sunset in chewing. I see no reason as yet for materially changing the opinion expressed in this journal (January 1907), that only under particular circumstances, and especially in races that eat edible earth, roots, etc., can the friction of the food have any appreciable effect upon surfaces of the teeth not exposed to the action of mastication, although it is not necessary that antagonists should come into direct contact with each other in order to be worn down by attrition.

There is one feature of wasting sometimes met with in human teeth which I have not yet seen in the teeth of animals; that is, the occasional undermining of enamel walls. The effect is very much the same as that produced by capillary currents of acid (as described in the February issue of the *Cosmos*), except that in the latter the polish is wanting.* I have not been able to produce it by brushing horizontally, though one can approach it closely by vertical action of the brush. Possibly by means of capillary currents in conjunction with friction the effect might be exactly imitated, but I have not tried this experiment as yet. The undermining here referred to has been met with in my experience especially where the wasting was accompanied by attrition.

The sharp enamel margins are, on the whole, one of the most difficult features to account for satisfactorily. Acids in conjunction with friction round the margins off; friction alone leaves them sharper, but not always as sharp as they are sometimes seen in wasting in the mouth. I have produced the sharpest margins by the action of hydrogen dioxide in conjunction with the brush, but it is doubtful, as I have already shown, if agents of this nature are to be found in the human mouth.

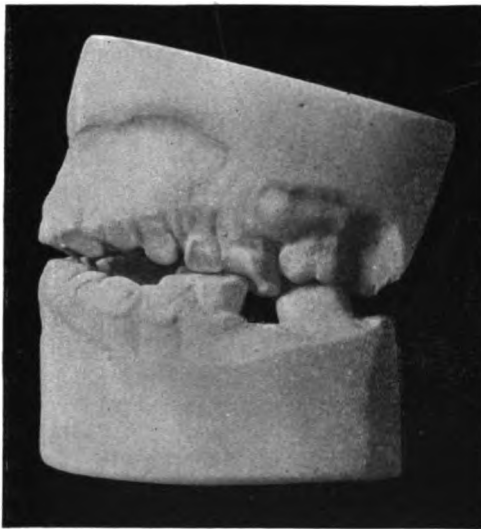
*I want to mention in this connection that Hinkins (*Cosmos*, 1905, p. 323) calls attention to "certain lines of flow of the saliva in the mouth."

III. GENERAL WASTING OF THE TEETH.

In our journals we occasionally find reports of cases where there has been a general wearing down of all or nearly all the teeth, especially from the cutting edge and morsal surface. A typical case of this kind is shown in Fig. 13, for the cast of which I am indebted to Dr. Davenport of Paris.

history of this case, but it is identical in appearance with the cast "IV, 14," illustrated in the *Trans. Odontological Society of Great Britain* for March 1907, in an article by J. G. Turner on "Hereditary Hypoplasia of the Enamel." Here also the incisors and canines devoid of enamel are flat with the gums, while the third molars appear intact. A similar cast of a case in conjunction with faulty

FIG. 13.



A case of general wasting.

These are very rare cases, and the only one which I have met with among the hundreds of cases of wasting that I have examined is that shown in Fig. 14, page 17 of the *DENTAL COSMOS* for January; and even this was not typical.

Without attempting a study of this form of wasting at this time, I will only state that the wearing appears to be due to attrition in conjunction often with faulty development (hypoplasia of the enamel). It is particularly worthy of note in reference to the case shown in Fig. 13 that the second molars are absolutely free from every trace of wear. I have not as yet been able to obtain the

development was sent me by Mr. Stanley Mummery of London.

In another class—of which the case described by Kirk, and referred to under division I, may be taken as an example—we have a breaking down due to a general abnormally strong acid reaction of the oral fluids, accompanied by more or less softening of the dental tissues and modified by the action of mastication.

I wish here chiefly to emphasize the fact that these cases must be treated individually, and are not to be classified with the local processes with which I have dealt in my articles.

EXTENSIVE GOLD INLAYS AND THEIR APPLICATION TO BRIDGE WORK.

By JOSEPH W. WASSALL, M.D., D.D.S., Chicago, Ill.

(Read at the union meeting of the Maryland State Dental Association and the
District of Columbia Dental Society, Washington, D. C., June 7, 1906.)

THAT the conventional method of making artificial crowns with bands telescoping over roots or broken-down teeth is unsound practice has long been recognized by both the profession and the laity. While under favorable conditions good and safe results are obtainable, insufficiency of coaptation of band-edge and tooth-cervix is of such frequent occurrence that it constitutes a serious defect and calls for a change of method. It is a fault observed in the application of crowns to restore lost dental tissue as well as in their employment for bridge abutments.

The normal anatomical formation of bicuspids and molars (see Figs. 1 and 2) constitutes a natural and most serious bar to the perfect fitting of a band. An examination of typical tooth-forms gives instant conviction of the irrationality and impossibility of attempting accurate and scientific coaptation at the tooth's neck, at once the most important and vulnerable point. It is all too evident that an almost universal custom of procedure is based on wrong mechanical principles, and produces unhygienic, unsanitary, and disease-engendering conditions.

Flagrant violations of all the laws of dental hygiene and mechanics constantly come into our hands as crown work. Not one of us but can recall specimens which one has had occasion to remove—specimens which bring the blush of shame for the inefficiency, to use a mild term, of the profession—and the worst offenders are not always men unknown to fame. It is a rare thing, indeed,

to find a shell or banded crown with a perfectly fitted joint. This, it is plain, is not so much the fault of the man as of the method. The reasons therefor depend upon the very nature of the anatomical characteristics of the supporting teeth.

What is the history of the shell or banded crown—used either as a crown or abutment? As I have before said, some portion of its border stands away from the cervix (Fig. 3)—a condition usually impossible to avoid. The gum in that region is subject to irritation both from the sharp metallic edge and the decomposing débris lodged beneath it. The free gum margin will therefore be irritated, it will become more or less congested, presenting inflammatory conditions varying in intensity from slight redness to severe and dangerous purulent pyorrheal inflammation. The effects of such condition may be tenderness or positive pain, tendency to hemorrhage, true pyorrhea, formation of pockets, occasional abscess, etc. In many cases caries of the cervix, crown, or root supervenes, encouraged both by the lodgment of débris in the overhang or in the cul-de-sac formed by the disintegration of the cement from beneath the band. Pain in the pulp, with neuralgia, may now be a complication. The situation is aggravated by a growing reluctance to the use of the brush, or disuse of the teeth in mastication, followed by a constant increase in severity of all the malignant conditions above enumerated. If the progress of such influences be not checked, the tooth is greatly impaired or

lost, either from caries or pyorrhea, or both. This is the true clinical picture presented by a severe case, and unfortunately it is not an uncommon ex-

the crown being flush with the tooth's surface.

The method recommended has been in use in my office as routine practice for

FIG. 1.



FIG. 2.

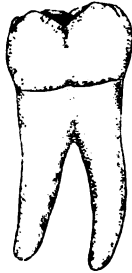


FIG. 3.



FIG. 4.



FIG. 5.

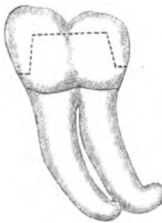


FIG. 6.



FIG. 1: Buccal surface of upper left first molar.

FIG. 2: Lingual surface of lower left first molar.

FIG. 3: Diagram showing space between band and tooth.

FIG. 4: Lingual surface of lower left first molar showing shoulder for flush-joint crown.

FIG. 5: Lingual surface of lower left second molar showing preparation of tooth-crown.

FIG. 6: Mesial surface of upper right second bicuspid showing preparation for partial flush-joint crown.

perience. Does not a practice which brings forth such evil results cry out for remedy?

The substitute I have to offer for the old method is a crown inset into the substance of the tooth, the gold margin of

some time, and is a development and outgrowth of the swaged gold inlay method of tooth-filling, being a more extended application of gold inlay work. Such a covering seems to furnish a tenaciously adhering attachment, even when the

natural tooth is much wasted and broken down by caries. Indeed, it is a constant surprise how securely such a covering seats itself and is retained.

There is no longer any necessity for extending the margin of the crown beneath the gum margin of bicuspid and molars. This alone is a great gain, *i.e.* to the permanence of the operation, as a promoter of hygiene of the mouth, comfort to the patient during the operative procedures, and ease to the operator. The new crown is in reality an "inlaid" crown, so far as its marginal coaptation is concerned. The continuity between tooth-surface and gold crown (Figs. 4 and 5), *i.e.* the gold being flush with the tooth-surface without any overlapping gold band, is the ideal condition in all tooth-crowns. This is the essential feature of the method. It should be understood that there is also perfect coaptation of the metal portion of the crown to the tooth over all covered surface.

A great advantage in the method is the opportunity it affords of avoiding destruction of sound tissue. It enables one to construct a partial crown (Fig. 6) to restore teeth which are much broken down, by allowing the inlaid crown to embrace two or three sides of the tooth only; whereas by the old method, the whole tooth being covered, greater tissue sacrifice is required. This kind of crown is particularly useful as a bridge abutment.

TECHNIQUE OF THE METHOD.

It may be described under two separate processes: First, the preparation or shaping of the tooth with the taking of impressions; second, the making of the crown from the impressions in the laboratory. The ultimate setting of the crown needs no description.

In the preparation of the tooth we have to deal with two classes of cases, *viz.* the tooth which requires a crown for its own conservation, which of course presents a tooth greatly impaired by caries, and the case of a molar or bicuspid which is to be covered in order to

serve as a bridge abutment. In the latter case we will assume for the sake of description that the tooth is perfect, but this is rarely the fact, for usually fillings more or less extensive are present, which simplify the work.

In the mouths of patients highly susceptible to pain, very sensitive teeth may have their pulps removed. This, however, is permissible only in matured teeth. Such devitalization is in actual practice rarely required, although it is quite justifiable when indicated.

As the crown is to be made entirely in the laboratory from impressions, the preparation should proceed with the end in view that an impression is to be taken. The tooth is first shortened by removing one-third of its occlusal end by means of engine stones. Thin disks held in the straight handpiece are then employed to remove the mesial and distal surfaces of the tooth, and similar disks and saucer-shaped stones in a right-angle handpiece are used to reduce the buccal and lingual surfaces, as well as the remaining sharp angles. A sharp shoulder approximately one line in width is left at or near the cervix, preferably just short of it, and against this the finished crown is to be adapted flush with the tooth-substance. All sides are to be well beveled or converged to the occlusal end. In cases where extensive loss of tissue has already occurred, the judgment of the operator will retain and properly shape the remaining portions along the lines above set forth. It should be remembered, however, that an astonishing degree of retentive power exists in even slight projections, depressions, and irregularities of surface when exactly and closely covered by an accurately fitting cope in the manner to be described later.

If, however, there is presumed to be insufficient anchorage, provision for from one to three posts in the canals may now be provided for.

The application of this method to bridge attachment when a sound tooth is to be utilized is as follows (the description will be of a molar case, but it applies of course to incisors, canines,

and bicusps): The entire buccal portion, including the buccal cusps is preserved. The shortening of the occlusal surface is confined to its lingual half, including the lingual cusps. This surface is ground down to a step at right angles to the long axis of the tooth. With a thin half-inch wheel a groove is ground mesio-distally in the center of the occlusal surface and one line in depth. This groove is now extended over on to both the mesial and distal surfaces to almost the cervix by means of fissure burs. Let the lingual surface be now ground away, leaving the well-defined shoulder before described near the cervix, and be further extended on to both the mesial and distal surfaces up to the grooves which were previously made there. We now have a result, as shown by Fig. 6, which furnishes a mechanically perfect attachment free from the objectionable features of the old method of making the so-called "faced crown" with overlapping and overhanging edges both under the gum and on the approximal surfaces.

The next step is the taking of impressions. First, we take an ordinary bite in S. S. W. modeling composition, which is to serve as a guide to occlusion. Second, an impression is taken of the prepared tooth and of the adjoining teeth on each side, with modeling composition in a small tray, to serve as a guide in reproducing contour. Third, an accurate impression in Detroit "Perfection" modeling compound is taken of the entire prepared tooth, from which the model is obtained upon which to make the cope.

The occlusion and contour impressions are obtained in the usual simple manner. The impression for the cast of the prepared tooth must, however, be true and accurate, which is not a difficult matter. An impression cup is made of a copper band very loosely fitted to the tooth to be crowned, the edge being trimmed to conform to the alveolar border. The copper band is made one-quarter of an inch longer than the projecting tooth-crown, and is filled with softened Detroit modeling compound

and pressed over the tooth-crown until the edge of the copper ring reaches the gum. It is chilled with cold water and removed, when, if properly done, a sharp impression of the entire crown, showing the shoulder well defined, will be the result.

The three impressions now go into a box which bears on the cover the patient's name and the date of the next appointment. This goes to the laboratory and is there completed, the patient not being seen again until the cope is to be set or to be used for a bridge abutment. It will be evident that much time and inconvenience is saved to the patient by not having the matrix conformed directly to the prepared tooth. The operator also, if a busy man, may delegate this work to laboratory assistants, or do it himself at his greater leisure.

THE LABORATORY PROCESS.

The Detroit "Perfection compound" impression is invested in a pad of soft plaster, which is trimmed, when partly hard, to a square measuring about one and one-half inches. The redundant compound and plaster is trimmed away so as to more clearly show the margins to which the crown is to come. The trimmed impression and plaster are rubbed with pure talcum powder, blowing out the surplus.

Ames' brown crown and bridge cement is slowly and thoroughly mixed to the same consistence as for a filling. The soft putty-like mass of cement is rolled in talcum and pressed over the impression, using sufficient force to make it conform to all the inequalities, thus making a strong, perfect cast or model of the original. The cement-covered impression is submerged in cold water and left to thoroughly harden, which requires about twenty minutes. To separate the compound impression and cement cast it is well to submerge them for a few minutes in hot water, when a knife will very easily prize them apart. The cement cast just obtained is invested with plaster in a steel cup called a bed-

plate—a part of the Brewster inlay swaging outfit—the surplus plaster when hard being trimmed off flush with the edge of the bed-plate; a small piece of wet cotton is placed on the cement cast, to remain in place at least an hour. This is done to satisfy the crystallization requirements of an hydraulic cement, and thereby obtain the maximum strength for the cast, which with ordinary care in working is quite sufficient to withstand the force necessary to get accurate and certain results.

Either platinum foil 1/1000 inch or gold foil No. 120 may be used for the matrix. I prefer to use the platinum foil, partly swaging it to place on the cast, using cotton held in a pair of foil-carriers. With the cotton in place, the bed-plate and foil are placed in the screw-press water-bag and partly swaged to place. The foil is annealed perfectly under a blowpipe and swaged, this time without using cotton, the untrimmed foil being again annealed and temporarily put aside. A piece of well-annealed virgin platinum plate of No. 38 gage is swaged and adapted over the same cement cast—one here being particularly careful to have the metal slightly overlap the line the flush or inlaid crown is to cover. The partly swaged foil is again placed on the cement cast and is finally swaged to place, after which the adapted and trimmed platinum plate is put over the foil and both are swaged.

Both foil and plate are removed and are flushed in between with 22-k.

gold solder, the surplus foil being trimmed off. This leaves a perfectly adapted metal cope sufficiently stiffened and rigid to handle in taking the bite for use in building-on a tip of accurate occlusion and contour. This cope will be a perfect fit—providing, of course, that everything has been done according to the laws of mechanics.

The bite which is taken is poured in plaster, separated, and trimmed; a small piece of softened modeling compound is molded over the metal cope, and the bite is pressed into it in order to obtain the occlusion, the characteristic grooves, fissures, and cusps being finally carved in the modeling composition tip. A Melotte metal die and counter-die are made from the carved tip, and a gold tip is swaged between them, waxed to the cope, invested, and soldered with 20-k. gold solder, which allows for any patching with 18-k. gold solder that may be necessary. The polishing is done in the usual way except for the margins, which are worked down with a fine file to prevent polishing beyond the finished line. Rapidly revolving stones are much more uncertain and harder to control.

To the writer's mind the method herein suggested of having a well-defined shoulder in the coronal portion of the tooth near the gingiva, but not beneath it, into which the metal covering is inlaid flush with the enamel surface, makes for greater accuracy and permanence, and if generally adopted will mark an advance in the practice of dental surgery.

ON THE PATHOLOGY OF PERICEMENTAL INFLAMMATION.

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(Read before the Susquehanna Valley Dental Society, May 22, 1907.)

ALTHOUGH pericemental inflammation, both acute and chronic, has been a favorite subject for study and investigation with a host of distinguished pathologists and clinicians, we are still confronted with the indisputable fact that certain phases of this problem remain as yet within the sphere of unexplained pathologic reactions. Prior to the publication by Virchow of his epoch-making studies in cellular pathology, inquiry into the nature of the changes occurring in tissues consequent upon the action of abnormal or disease-producing influences was of necessity limited to a survey of the external or macroscopical manifestations of the phenomena occurring within the individual cellular units. At the present time, and by virtue of the impetus given to the study of general pathology by this investigator and his students, we are able to follow step by step the changes which take place in cells and intercellular structures, and to more accurately interpret the external and internal manifestations of morbid processes. But this knowledge of cellular pathology would still constitute an insufficient means toward the ultimate solution of the problems with which the practitioner is daily confronted, were it not for the assistance, incalculable in value, which physiologic and pathologic chemistry—outgrowths of cellular pathology and bacteriology—have rendered, and which enable the student to accurately explain in many instances the complex and intricate nature of the chemical mutations constantly taking place within tissue cells, both in health and disease.

All changes which occur in tissue cells consequent upon the action of an irritant

must be considered in the light of a vital reaction the ultimate purpose of which is the re-establishment of function on the basis of the least stress upon the affected tissues and dependent structures. "Inflammation" is the classic generic term which since the time of Galen and his disciples has been in use to designate the chain of phenomena which constitute this vital reaction. As these inflammatory phenomena are the basis of all disease processes, a thorough knowledge of their nature and significance is an imperative requisite for a fair comprehension of all the remaining phases of the general pathologic problem.

As the subject of this communication is closely related to the fundamental problem of general pathology, it may not be amiss to review in this connection the changes which occur in the pericementum and the alveolar and gum tissues as the result of bacterial invasion; and in order to render this survey less complicated, I have taken the liberty to classify inflammations of the pericemental membrane as of two kinds, namely, *endogenous* and *ectogenous*—the *endogenous* variety being that in which the bacterial excitant has gained access to the pericemental tissues via the circulation, and the *ectogenous*, that in which the pericemental tissues have become involved by a process of continuity and through the agency of micro-organisms which, originating from outside of the body, have eventually become lodged in the pulp tissues and finally have migrated toward the pericementum.

The initial change in a case of typical inflammation is a dilatation of the capillary veins and arteries, occurring concomitantly with a marked slowing of the

circulation. At this stage the leucocytes, which prior to the inception of this phenomenon were relatively few and scattered throughout the circulating fluid, are to be seen in considerable numbers clinging to the walls of the vessels, which, having become by this time markedly dilated, afford to the leucocytes a number of small portals of exit—the stomata of the endothelial coat of the capillaries. This migration of leucocytes into the perivascular spaces is preceded by the exudation of a fluid differing from the ordinary lymph exudate in that it contains a larger proportion of albumin. The liquid and solid exudate (large mononuclear and the polynuclear leucocytes) is traceable to an increased blood pressure—caused, in part at least, by the slowing of the blood current and by the dilatation of the capillaries—and to the motility of the leucocytes.

In addition to the foregoing phenomena, tissue proliferations leading to regeneration or hypertrophy occur throughout the progress of the inflammation. To recapitulate, we may state, first, that upon the occurrence of a degree of irritation strong enough to induce vascular changes, yet insufficient to at once destroy the vitality of the tissue, the reaction is hyperemia; second, that consequent upon the increased volume of blood there occurs an exudation of a lymph-like fluid and a migration of leucocytes through the vessel walls; third, that at this point, or perhaps at some later period, a proliferation of fixed tissue cells begins; fourth, that if the vascular alteration were slight, and the excitant of the inflammation acted only for a short time, restoration of function would follow; and fifth, that if the exciter of inflammation be so powerful as to successfully resist the bactericidal power of the tissues, instead of immediate restoration of function an additional series of changes occurs, viz, death and liquefaction of the migrated leucocytes and of some of the fixed tissue cells—in short, suppuration.

Although in the foregoing remarks the writer has endeavored to review serially the various phenomena occurring in

the course of a typical inflammation, we should not lose sight of the important fact that while this pathologic narrative of inflammation greatly simplifies its comprehension, especially by the student, the probability is that clinically these phenomena do not take place seriatim or at definite periods. The exudate of inflammatory lymph may occur simultaneously with the proliferation of the fixed tissue cells; and again, the proliferation of the fixed tissue cells may precede the exudative period. In other words, the manifestations of an inflammatory process cannot be enumerated in arithmetical order; for here, as well as in the case of any other process in which the personal vital equation is the paramount factor, mathematical precision is out of the question.

A study of pericemental inflammation of bacterial origin involves a consideration of the following questions: (1) Predisposing causes. (2) Direct causes. (3) Immediate results—i.e. changes in the pericemental membrane and associated structures. (4) Remote consequences.

PREDISPOSING CAUSES.

The predisposing causes of pericemental infection of the endogenous type are all deleterious influences which, acting upon the pericemental tissues, induce nutritional disturbances, leading to the establishment of areas of diminished resistance at some point in the pericementum. In the case of teeth with living pulps, general nutritional disturbances of the hyperacid variety are potent predisposing causes, if such teeth be subject to a degree of continued stress above that which they are normally and functionally able to withstand—i.e. malocclusion. In the case of teeth the pulp contents of which have become devitalized and have undergone moist gangrene and putrefactive decomposition through the agency of saprophytic bacteria, a powerful predisposing cause is to be found in the products resulting from the gradual breaking down of the constituents of the pulp.

The chemistry of pulp-putrefaction

was ingeniously worked out by the late H. H. Burchard (*vide* "Dental Pathology, Therapeutics, and Pharmacology," page 384), on the correct assumption that the changes which take place in nitrogenous tissue outside of the body as the result of the activity of saprophytic bacteria must of necessity be paralleled in the putrefaction of pulp tissue. Lately Dr. J. P. Buckley has again called attention to these changes (*vide* "Transactions of the Fourth International Dental Congress," vol. ii, p. 10) advocating a method of treatment which according to clinical reports is entitled to most serious and sympathetic consideration. The chemical end-products which are thus produced doubtless play the part of active irritants on the pericementum, especially on that part of the organ immediately surrounding the apical end of the root. Thus an area of diminished resistance is established, which becomes at once a favorable field for the development of the pyogenic cocci concerned in the production of the suppurative process.

In the endogenous variety of pericemental infection it is of course understood that there has been no solution of continuity of the hard tissues of the tooth-crown, and that the direct exciter of the infection has gained access to the pericementum either via the circulation or through the alveolus, the organisms traveling in the space between the alveolar wall and the root of the tooth through the structures described by Black as the glands of the pericementum, and which Malassez and others consider to be but the remnants of the epithelial enamel organ. Thus Black, in an article on the "Fibers and Glands of the Peridental Membrane" (*DENTAL COSMOS*, 1899, vol. xli, p. 101) states that—

But little can now be said of the function of the network of glands of the peridental membrane beyond what is indicated by their form, location, and histological characters. With the knowledge of their position and general character, clinical observation leads to the conclusion that they are readily disturbed by certain drugs, notably by mercury and iodine; and that they are often disturbed

by substances poisonous to them floating in the blood streams. This is evidenced by the appearance of marginal gingivitis, with soreness of the peridental membranes. Such disturbances would not be likely to occur without the presence of some specialized or secretory tissue.

It seems to me very certain that the disease which I have described as phagedenic pericementitis has its seat in these glands. The location of the initial lesion and its progress to the formation of deep pockets indicate that the beginning is in these glands, and that in its progress they are followed into the depths of the alveolus, the fibers and adjacent tissues suffering by reason of their proximity. It also seems to me that this disease is caused by some micro-organism not yet identified, which has a special tendency to this tissue as the bacillus of typhoid fever has a special tendency to Peyer's patches and the agminated glands of the small intestine. But neither of these propositions has yet been made out in a way to satisfy the demands of science. I have only clinical observations as yet on these points, and it is becoming almost a proverb that upon such subjects clinical observation unsupported by direct scientific physical research is extremely unreliable.

As moist gangrene of the pulp, with consequent albuminous decompositions, occurs in the absence of caries, and as in some cases infection of the pericementum follows, the theory that bacteria, saprophytic and pathogenic, invade the pulp and pericementum via the circulation, ceases in the light of these facts to be a theory, and becomes a fact. It is also admitted that bacteria may invade the pericementum via the gum margin, and it certainly is not impossible to conceive that in some cases of so-called pericemental abscess, micro-organisms have in this way gained an entrance into the tissues surrounding the root of the tooth.

The writer has elsewhere given his views concerning the etiology of pyorrhea alveolaris and pericemental abscess, two infectious disturbances of the pericementum identical from a strictly etiological standpoint. Pericemental abscess may be considered as a form of pyorrhea alveolaris, modified by the direction in which the pus discharges and by the fact that in pyorrhea alveolaris the perice-

mentum, owing to solution of continuity around the gum margin, is continually kept infected by micro-organisms from the oral fluids.

In a paper entitled "Uratc Deposits upon the Roots of Teeth," which it was my privilege to read before this association at a meeting held at Harvey's Lake, Pa., May 27, 1905, I stated that in pyorrhea alveolaris of systemic origin the predisposing cause is very frequently a malocclusion so small as to defy detection. This leads to over-activity, excessive oxidation, decrease of alkalinity, and probably to the formation of lactic acid through the breaking down of the complex proteid molecules of the pericemental membrane, and finally to the precipitation upon that area of the uratic salts held in solution in the blood by virtue of the alkalinity of the latter fluid. The deposited urates create a *locus minoris resistentiæ*, and, together with pyogenic germs, are responsible for the formation of pus. If the pus should encounter no resistance to its exit through the gum immediately overlying the abscess, the condition will be a pericemental abscess, but should it discharge through the neck of the tooth, the condition will be one of pyorrhea. While the author would not attempt to include pyorrhea alveolaris in the scope of this paper, it is advisable to point out that the pathogenesis of the systemic form differs to a considerable extent from that of the simpler local form, in which the disturbance begins at the neck of the tooth, and by continuity causes the gradual destruction of the pericemental membrane and the exfoliation of the tooth.

In the ectogenous variety of pericemental infection the most important predisposing influence is the molecular dissolution of the hard tissues of the tooth through caries, and the consequent exposure of the pulp. If the latter organ should become the seat of bacterial activity (pyogenic cocci), there occurs within it a series of pathologic phenomena ending in gradual and progressive death and liquefaction of its cellular components, which process, if not ar-

rested, will end in the involvement of the apical pericementum, with the production of what is designated as alveo-dental abscess. The general nutritional state of the individual is likewise a factor not to be disregarded in the study of all types of pericemental infection. Well-nourished individuals—those in whom the continued breaking down of tissue for the liberation of the potential energy necessary to carry on the processes of life is fully compensated by the intake and assimilation of foodstuffs, and in whom the elimination of waste material is not unduly delayed—are in that ideal state of absolute health and vital defensiveness at which, theoretically at least, bacterial invasion would have less chance to occur and subsequently induce pathologic processes. Any influence which disturbs this ideal balance, and decreases the activity of the defensive elements of the body, must be considered as a predisposing cause of all types of inflammatory disturbances, including, of course, those localized in the pericementum. The influences which may affect the nutritional balance would be all functional disturbances characterized by either insufficient or excessive oxidation, leading to the production of acid end-products in the former case and to alkaline in the latter. Also, all general pathologic states the result of bacterial activity in any of the vital organs are predisposing factors of the pathologic state now under consideration.

To recapitulate, we will state that the predisposing causes of *endogenous* pericemental inflammations are—(1) Deleterious influences responsible for the establishment of areas of diminished resistance in the pericementum, both in teeth with vital and in those with devitalized pulps. (2) Pulp-putrefaction following moist gangrene. (3) Local or general gingivitis, causing a recession of tissue around the gum margin (avenue of infection in some cases of pericemental abscess). (4) All such conditions as may lead to death of the pulp, such as large fillings, erosion cavities, the too violent use of polishing instruments, traumatisms such as those occurring in

the course of regulating operations, falls, etc.

The causes of *ectogenous* pericemental inflammation are—(1) Caries. (2) Involvement of the pulp tissue, suppuration, death, and putrefaction. (3) Diminished local resistance.

DIRECT CAUSES.

The direct causes of pericemental infection are the bacteria immediately concerned in the inflammatory process, namely, the staphylococci pyogenes albus and aureus, the streptococcus pyogenes, and the diplococcus pneumoniae. These different species of bacteria lead to the manifestation of different forms of inflammation. Thus the type of inflammation induced by the staphylococci is localized in character, while that induced by the streptococci is characterized by a tendency to spread, involving large areas of tissue. Again, in the inflammation in which the staphylococcus is the predominant exciter, abundant pyogenic discharge is almost invariably observed, while in that in which the streptococci are the major factor, pus is less abundant, the discharge being rather of the mucous or sero-purulent type. The diplococcus pneumoniae—a bacterium found in the majority of human mouths in a latent state—has also been found to be the most active organism concerned in the production of so-called pericemental abscess.

In a series of investigations by Dr. Emil Schreier, carried on in the laboratories of Professor Weichselbaum (*Oester.-ungarische Vierteljahrsschrift für Zahnheilkunde*, April 1893, and *DENTAL COSMOS*, August 1893) with the view of determining the nature of the bacterial exciter in pericementitis, several important facts were brought out, particularly one in regard to the diplococcus pneumoniae, which was found to be the most active exciter in almost all the cases of pericemental infection examined by him. From this discovery the author draws a conclusion which explains the influence of "catching cold" on the occurrence of pericemental infection, for if—as ascertained by him—the diplococcus pneu-

moniae is the most active bacterial exciter in many cases of pericemental infection, then this bacterium in the presence of a diminished vital resistance should become equally active whether it be lodged in the pericementum or in the bronchial and pulmonary tissues.

Apart from its purely bacteriologic aspect, investigation into the nature of the invading organisms has consequently a significance which, in view of clinical observations, cannot be too strongly emphasized.

CHANGES IN THE PERICEMENTAL MEMBRANE.

The pericementum having become invaded by bacteria, becomes at once the seat of a series of well-defined phenomena, nearly all of which give rise to special well-marked clinical symptoms. The cycle of inflammatory changes already described takes place in the substance of the membrane. The initial hyperemia, the exudation of the inflammatory lymph, and the proliferation of the pericemental fixed tissue cells are responsible for the production of that classical symptom of pericemental infection—namely, "elongation of the tooth." If at this period in the inflammatory process the defensive elements of the membrane be insufficiently powerful to dispose of the bacterial invaders in a radical way, death of the migrated leucocytes will occur, and the cellular structures around the focus of exudation and bacterial activity will gradually undergo a process of granular degeneration, and after being acted upon by the proteolytic ferment elaborated by the bacteria, will be liquefied. This gradual degeneration of tissue cells is bounded anteriorly by an area of inflamed cells, which upon liquefaction of the degenerated layer of cells likewise undergo degeneration, and in that way the process continues as long as bacterial activity persists.

As the result of these tissue changes, which of course proceed in the direction of least resistance, the plate of alveolar bone becomes involved to the extent of becoming the seat of rarefying osteitis.

After the continuity of the plate of bone is broken at any point, the gingival tissue becomes involved.

I desire at this point to call your attention to a statement frequently encountered in connection with the clinical description of dento-alveolar abscess—namely, that the pus perforates or finds its way through the alveolar plate. It should be borne in mind that pus in itself has no perforating or eroding properties, and that if the alveolar bone becomes perforated, it is as the result of a destructive inflammation in its own substance, and not—as might be supposed—as the physical or mechanical result of the action of pus.

The next tissue to become involved, as has just been stated, is the gum overlying the affected tooth, and here the destructive inflammatory process repeats itself, the gradual degeneration and liquefaction of its cells resulting in the establishment of an open tract beginning at the focus of infection in the pericementum and ending in the external surface of the gum; in other words, a fistula has been established. Through this fistula the inflammatory products—in the form of inflammatory lymph, leucocytes in different stages of degeneration, degenerated fixed tissue cells, and the products of the liquefaction of leucocytes and fixed tissue cells—escape. If upon the evacuation of pus the focus of infection still remain uneradicated, the inflammatory process will continue, although with clinical manifestations far less severe than those preceding the discharge of the purulent inflammatory products, and the condition known as a chronic dento-alveolar abscess with fistula will be established.

As the result of the discharge of pus there occurs a decrease in the intensity of the bacterial invasion through a diminution in the number of the bacterial invaders, and consequently a relative increase in the power of the tissues to counteract the morbid bacterial activity. The intensity of the inflammation is consequently decreased, and assumes a type characterized by slow progress, moderate intensity, and milder clinical symptoms. In this type of chronic inflammation additional

tissue changes occur immediately surrounding the initial focus of infection—namely, a more thorough and complete organization of the aggregation of embryonal connective tissue cells surrounding the focus of infection and the fistula.

This aggregation of embryonal connective tissue cells originates from the inflammatory lymph and constitutes the abscess sac, erroneously designated in years gone by as the "pyogenic membrane." The abscess sac in an acute abscess being but incompletely organized adheres loosely to the root, and consequently, upon the extraction of the tooth, remains within the tissues—becoming, later on, the point of departure in the process of tissue regeneration. The organization of such a membrane or abscess wall limits the ravages of the inflammatory process around the root of a tooth and within the substance of its maxillary supports. Occasionally, the symptoms of a chronic abscess may assume a subacute character, this occurring principally during the course of acute infection of the respiratory passages ("colds"), and at periods in which the vitality of the subject is temporarily yet markedly decreased. Upon the extraction of a tooth affected in this way, a bulbous swelling is noticed at some portion near the apical third of the root.

It should be noted, however, that all bulbous swellings attached to a tooth-root are not necessarily the outcome of chronic dento-alveolar abscess. Many such swellings or sacs are but pericemental or radicular cysts, not necessarily the outcome of pyogenic infection, and differ from the so-called abscess sacs in etiology and morbid anatomy. Thus a cyst may develop on the apex of a tooth consequent upon a degree of irritation of the pericementum such as might be induced by the pressure of a root-canal filling protruding beyond the apical foramen. In such an event the cystic sac and fluid are aseptic, and are but the outcome of a physical stimulus. The evolution of radicular dental cysts has been studied by such distinguished pathologists as Magitot (*Archives gén. de Médecine*, 1872-73) Aguilhon de Sarran (*So-*

ciété de Biologie, 1884), Broca (*Traité des Tumeurs*, vol. ii, 1869), Verneuil ("Kyste périostique du Maxillaire," *Progrès Médical*, 1874), Malassez (*Archives de Physiologie*, vol. i, 1885), Charcot ("Étude clinique des Kystes périostiques," *Archives gén. de Médecine*, 1881), Bounot, Albarran, and many others.

Two theories from among the many which have been advanced in the endeavor to explain the evolution of radicular cysts account in a fairly satisfactory degree for the anatomic-pathologic characteristics of these tumors. In order to more clearly appreciate the difference between an ordinary subpericemental abscess cavity—i.e. bulging of the pericementum—and a dentigerous cyst, let us state at once that a bulbous swelling simply the result of a sub- or intra-pericemental abscess is composed exclusively of such cellular elements as enter into the formation of normal pericemental tissue; while the wall of a true dentigerous cyst, whether its development be due to a septic inflammatory process or to non-septic influences, is constituted internally of tissues other than those normally present in pericemental tissue—i.e. epithelial cells, either of the squamous or stratified variety. The two plausible theories above referred to are the "epithelial débris" theory of Malassez, which has been investigated by Verneuil, Reclus, and Albarran, and the periosteal theory of Magitot, modified by Broca. In Malassez' theory the epithelial lining of the cystic cavity develops from epithelial débris—the remnants of the enamel organ which persist even after the development of the tooth is completed, and are to be found in a latent state in the pericemental tissues. These epithelial cells, in the presence of a suitable degree of irritation, at once proliferate, forcing ahead of them the fibrous elements of the pericementum, resulting in the formation of a sac lined by connective tissue elements externally and epithelial cells internally. In the periosteal theory of Magitot, the internal epithelial lining of the cystic wall is unsatisfactorily accounted for, and consequently Malassez'

explanation is the one most generally accepted at the present time.

Radicular cysts, if formed through physical non-septic agencies, may become infected, but the presence of a cyst on any portion of a root is not necessarily a sign of purulent inflammation, for, as has already been stated, it may develop in the absence of pyogenic cocci.

The variety of chronic alveolar abscess without an apparent fistula is erroneously designated as "blind abscess," for this term implies that no communication exists between the focus of infection and the mouth-cavity. But as a matter of fact such a communication invariably exists, it being in the majority of cases the unobstructed root-canal of the affected tooth or a path between the root and alveolar surfaces. That a chronic abscess has a root-canal as its fistula, or a fistula discharging at the neck of the tooth, does not necessarily imply that it reached the acute stage at some period during its existence. It might have been from its inception, of an indolent type, the question of acuteness and chronicity of dento-alveolar abscess depending on these two factors: first, the number and degree of virulence of the bacteria, and second, the vital resistance of the tissues. Assuming that the crown of a tooth—let us say an upper central incisor—is decayed; that following this decay and exposure of the pulp the latter organ underwent gradual dissolution through inflammation; that the infection spread to the pericementum; that the activity of the bacteria is moderate, and that the tissues of and around the pericementum are normally active, the result will be a slow and continued tissue destruction, with consequent discharge through what might be termed a natural and anatomical fistula.

The location of the affected tooth is an important factor in regard to the course, duration, and degree of tissue destruction in pericemental infection. If, for instance, the infection in the pericemental tissues around a lower tooth be of the indolent type, slow in its progress and moderate in its intensity, the pus will by virtue of the laws of gravity tend to

follow a downward course, and will thereby cause more or less extensive tissue destruction, discharging eventually at some remote point. Burchard ("Dental Pathology, Therapeutics, and Pharmacology") states that "In some cases the pus may perforate the bone, and find passage along the submuscular tissue of the depressor muscles of the lip, opening above or under the point of the chin. The apices of the roots of teeth lying beneath the line of insertion of the mylo-hyoid muscle may cause an abscess to open in the neck."

The majority of submental fistulæ are due to an infective process such as has just been described. Gires and Rodin (DENTAL COSMOS, July 1901, page 734) report the case of a young woman twenty-nine years of age suffering from acute articular rheumatism and epileptiform hysteria. In the year 1891, during an epileptiform attack, the patient broke three upper incisors, but was not conscious of having injured any other teeth. About the beginning of 1895 she had a severe attack of articular rheumatism, localized in the knees. On recovering, she experienced an itching sensation in the submental region. About a week afterward, decided inflammatory symptoms had developed under the chin, and after the application of a poultice—as advised by a druggist—a tumor of the hardness of a green apple developed, and invaded the symphysis. This submental fistula persisted until a right central incisor—containing a pulp which, having become strangulated by a traumatism received during the epileptiform attack eight years previously, had undergone putrefactive decomposition—had been suitably treated. The end-products of the breaking down of the pulp, acting as irritants upon the pericementum, had established in that organ an area of diminished resistance; and here eventually pyogenic bacteria, finding a suitable soil, induced the progressive destructive inflammation which ended in the formation of the submental fistula, and which lasted for over one year—namely, until the focus of infection in the tooth was completely removed.

REMOTE CONSEQUENCES.

Owing to the intimate relations of the teeth and soft tissues of the mouth with practically every organ of the body, it not infrequently happens that pericemental infections cause serious and at times fatal consequences. We have seen traced to this source disorders of the intestinal tract leading to pernicious anemia, and of the respiratory tract leading to purulent broncho-pneumonia. Septicemia and pyemia ending in death have also been caused by pericemental infections, as well as disturbances of the eye, ear, nose, throat, antrum; necrosis, partial and complete, of the lower jaw, facial paralysis, mandibular trismus, etc.

In order to emphasize as strongly as possible the degree of seriousness that may be assumed by the manifestations of pericemental inflammation, I will, with your permission, elucidate with clinical cases the varied nature of the complications under discussion. These cases are sufficiently reliable to be considered as an index of the conditions with which the practitioner may be confronted as the result of neglected cases of alveolo-dental abscess.

Let us at first consider the occasional effects of pericemental infection upon the osseous structure of the mandible. It may cause a relatively small necrotic process, or one involving the entire alveolar process and causing the loss of all the teeth. In several cases the process has been so severe as to cause the loss of the entire jaw, and through exhaustion the death of the patient; to wit, the following case reported by John S. Marshall ("Injuries and Surgical Diseases of the Face, Mouth, and Jaws"): Suppurative inflammation of the left third molar in a woman suffering from general debility caused an extended necrosis involving the entire jaw, which was finally lost from the articulation of the left side to the upper third of the ascending ramus of the right side. This case terminated fatally from exhaustion complicated with la grippe, sixteen days after the removal of the necrosed maxillary bone.

Facial and Submental Fistulæ.

A rather frequent outcome of neglected pericemental infection is to be found in facial and submental fistulæ, the more distressing because of the permanent disfigurement which they cause. The following cases are clinical observations of such instances:

(1) The patient, a strong, healthy-looking young man from Natal, had suffered for more than a year from constant purulent discharge from an opening below the angle of the jaw on the right side. The necrosed roots of the lower right first molar were removed, but did not eradicate the abscess. The second molar had a small cement filling, but was to all appearances healthy, as was also the third molar. Six months later the patient returned in the same condition and now consented to a further examination of the second molar, which was, however, still firm and free from tenderness on percussion. On drilling into the pulp-cavity pus escaped, the tooth was extracted, the sinus healed within a week, and a complete cure was effected. (COSMOS, November 1884.)

(2) A little girl, aged eleven years, had an abscess originating from the inferior right first molar and extending into the tissues of the neck, accompanied with extensive swelling and tenderness, but with no acute pain. The swelling of the parts had followed an attack of severe pain in the tooth and jaw, from which she had suffered three weeks previously. For a week the jaws had been closed, and the only food taken each day was a little milk. The child had been confined to bed for a part of the time, and when presented for treatment looked decidedly ill. The tooth was extracted under ether, and the pus-cavity found to extend downward three inches below the margin of the gum. Very little purulent matter followed the extraction of the tooth, but on injecting the pocket with hydrogen dioxide, large quantities were evacuated. The injections were continued once daily for six days, when the patient was pronounced cured, all discharge having ceased; the swelling had also nearly disappeared. (Dr. John S. Marshall, COSMOS, October 1885.)

(3) Excessive swelling of the left side of the face extending downward to the clavicle; the fourth attack within a year. The surgeon who sent the patient had opened the buccal wall into a cyst, which discharged a tea-cupful of yellowish sanious fluid at intervals,

gradually diminishing in quantity, until the symptoms subsided. A concealed root of the left first bicuspid was found, upon the removal of which a free opening with the engine revealed a sinus impacted with a cheesy deposit, which was broken up and the cavity washed with an antiseptic lotion, continuing the treatment daily for ten days, when a complete cure was effected. (Dr. Porre, COSMOS, November 1887.)

Disturbances of Hearing and Vision.

In reviewing the literature of dento-alveolar abscess, the writer has found that disturbances of hearing and vision, and in some cases a complication of both, occur with greater frequency than might be supposed.

(4) Mr. J., aged twenty-three years. There was no nasal discharge, the orifice from the maxillary sinus being closed by inspissated mucus. He complained of great weight and pressure upon the affected side, severe otalgia, and deafness. The second bicuspid and the first molar were missing, leaving a large opening into the antrum. Considerable necrosed bone was removed, and the usual stimulating treatment pursued for about four weeks, when the discharge ceased, and all other abnormal symptoms disappeared excepting the deafness. (Dr. Wm. Carr, COSMOS, August 1889.)

(5) Mr. M., aged thirty-three, who had until two years before been in perfect health. He then noticed an offensive discharge from the right nostril, which usually disturbed him greatly upon retiring, causing violent coughing when lying on the left side. Also, upon rising in the morning he experienced nausea, which continued until the nasal cavity had been entirely cleansed. He supposed he was suffering from catarrh, for which he sought and received treatment at intervals for twenty-one months, when the following additional symptoms were manifested: At intervals of three or four days he experienced attacks of vertigo, followed by severe otalgia and great tenderness of the teeth. For these symptoms he was treated for three months by his family physician, who finally advised him to consult me regarding what he supposed to be alveolar abscess. The right side of the face was then greatly swollen. Upon examination the full number of teeth were found, but the second bicuspid had been filled, and was pulpless. My diagnosis was not that of simple alveolar

abscess, but suppuration of the antrum. The extraction of the second bicuspid was followed by a slight flow of pus. A further examination showed the alveolar process greatly necrosed, but there was no visible opening into the antrum. After an application of cocain all necrosed bone was removed, and an opening made into the antrum, when a great quantity of offensive matter escaped. The lining membrane of the antrum had thickened to at least ten times its normal thickness; this pathological condition I have found in all chronic cases upon which I have operated. Then, proceeding to syringing the sinus, I failed to establish an outlet through the opening into the nares. The sinus was first cleansed with salt water, then with potassium permanganate, after which the orifice was closed in the manner already described. The patient was then directed to use Dobell's solution, by means of a nasal spray, in order to remove any secretion from the nares. The following day the pledget of cotton was removed, when the discharge seemed greater than on the previous day. The opening through the meatus had then been established and the cavity was thoroughly syringed with warm water until all traces of pus disappeared. It was then cleansed with a stimulating solution, and the pledget renewed. This treatment was continued daily for three months, when the patient was dismissed cured. I have seen him at intervals since during the past three years, and there are no signs of recurrence of the disease. (Dr. Wm. Carr, *Cosmos*, August 1889.)

(6) Patient suffered severe facial pains, involving the right eye, for relief of which he had sought the advice of an oculist, who suspecting some obscure dental origin, referred him to Dr. Porre. The patient had previously suffered from loss of appetite, indigestion, and unaccountable mental depression and nervous prostration, for which sea air had been recommended without avail, and this was followed by a severe illness. An abscess was found, occupying the entire right half of the roof of the mouth, the cause of which was finally determined to be caries in the alveolus at the base of the upper right canine. The tooth itself presented no evidence of disease. A free opening was made, the sinus washed freely with an antiseptic lotion, and a drainage tube inserted, and in a short time the patient was turned over to his medical advisers. (Dr. Porre, *Cosmos*, November 1887.)

(7) Young woman, strenuous habit, complained of a dull aching pain under the orbit. Pain had lasted from three to four months, attended by gradual elevation of the orbital

surface of the maxilla. The eye above this surface became so affected as to entirely lose its functions. After two or three months a discharge from the right nasal fossa of a thick, purulent fluid was perceived. This discharge persisted for eighteen months. An examination of the mouth at once revealed the cause of so much misery, and the removal of three roots, the seat of pericemental infection, was the simple means by which the nose and eye regained their functions. (Samuel Smith, F.R.C.S., *Dental News-Letter*, July 1857.)

(8) Discharges from the ear, abscess formation in front of the ear, loss of hearing. The discharges continued for several months, with severe pain on moving the jaw or protruding the tongue, inability to close the eyelids or to contract the orbicularis palpebrarum. There was also contraction of the auditory meatus, and through the orifice, on pressure being made on the cheek, pus oozed out. Removal of 'a molar' (?) brought about immediate relief.

(9) Constant lacrymation of the left eye, complete deafness in the ear of the same side, neuralgic pains radiating through almost all the teeth and muscles of the anterior region of the head. The neuralgia and deafness were cured by extraction of the upper left third molar, which was the seat of pericemental infection. (Ed. Vautier, *Gaz. des Hôpitaux*.)

(10) Eye projected upon the cheek for four months. The orbital wall of the maxillary sinus had yielded, the sinus became enlarged owing to the pressure of pus within, and the eye projected upon the cheek. (J. E. Garretson, *Cosmos*, October 1870.)

Disturbances Simulating Nasal Catarrh.

The discharge of an alveolar abscess into the maxillary sinus may set up in the nasal cavity disturbances simulating chronic nasal catarrh.

(11) Miss J., aged thirty, had considerable discharge from the right nostril, and had been treated for catarrh. The right side of her face was greatly swollen. Upon the affected side the second and third molars, the first bicuspid, and the canine were found in a healthy condition. The first molar and second bicuspid had been extracted for alveolar abscess three years previously. The swelling of the face had appeared twice before, when she had been treated for it by her family physician. On lancing, a free discharge of pus followed and an opening was

found into the antrum. After the usual treatment for five weeks the discharge ceased, all the parts resumed their normal condition, and the opening into the antrum was allowed to close. I suppose this condition was caused by one or both of the teeth previously removed for alveolar abscess. (Dr. Wm. Carr, *Cosmos*, August 1889.)

(12) Mrs. P., aged forty-five, who had been suffering for several years from intermittent fever, and had also been for some time troubled with a discharge of an offensive nature from the left naris—which had been diagnosed as catarrh—called to consult me about a first molar. Examination showed that all the teeth from the canine to the third molar had been removed except the first molar. This was badly decayed and loose, and upon pressure, pus oozed from the socket. The tooth was extracted, disclosing a cavity into the antrum corresponding to the roots of the teeth. The extraction was followed by a copious purulent discharge. There was considerable necrosis present. After treatment for over two months without any perceptible improvement, the patient left the city for the summer, and was under treatment while absent. At the expiration of four months she returned, still without improvement. Upon thorough examination a septum of bone about one-quarter of an inch in height was found rising from the floor of the antrum, dividing the cavity into two parts. By means of a chisel the septum was removed and found to be of a cancellous nature. After this operation the case readily yielded to treatment, and recovery resulted. (Dr. Wm. Carr, *Cosmos*, August 1889.)

Tomes (quoted by John S. Marshall) reports a case in which an abscessed upper lateral incisor discharged into the nose, the pus also dripping from behind the velum palati.

A case described by J. S. Marshall, *DENTAL COSMOS*, February 1884: Discharge from left side of nose, accompanied by occasional soreness of upper left central incisor. The discharge continued for four months. He had been under treatment for three months for nasal catarrh. Proper treatment of the root relieved the condition permanently.

Involvement of the Tonsils, Pharynx, and Larynx.

The inflammation due to pericemental infection may extend to the tonsils and the pharynx and larynx.

(13) A dentist's assistant had a tooth extracted which had been the seat of an abscess, without preliminary or post-operative treatment. Four days after the extraction the writer was called, and obtained the following history: The physical examination revealed a well-developed and vigorous young man with negative history. A swelling was discovered on the right side of the jaw. He complained of sore throat and chills and fever. Temperature 104°, pulse 120. The tooth had been extracted four days previous to the writer's visit. A swab taken from the throat was examined, and revealed streptococci in abundance. The patient was desperately ill for two weeks; the convalescence was slow, but recovery was finally complete. Here again is a case in which, through lack of proper precautions, we have extension of the inflammation to the tonsils and vault of the pharynx. (Dr. D. J. Brown, *Cosmos*, February 1906.)

(14) Patient had been treated for years for disease of the throat, involving at times the pharynx, larynx, and fauces, causing serious local distress and general deterioration of the health. The throat disease disappeared and the patient's health rapidly improved under the simplest remedies after extracting several ulcerating teeth, particularly a third molar root which was evidently the cause of the trouble. (Dr. Porre, *Cosmos*, November 1887.)

Involvement of the Maxillary Sinus.

The involvement of the maxillary sinus is perhaps one of the most common complications of pericemental infection—especially affecting the bicuspid and first molar in the upper teeth.

(15) During the past eight months, in addition to the cases in his own practice, Dr. Wm. Carr of New York has operated upon fourteen cases of diseased antrum for a throat and nose specialist. Of these cases, none resulted from chronic rhinitis, none from hypertrophic rhinitis, one from dentigerous cyst, two from polypi, and eleven from diseased teeth. This seems to clearly refute the argument of those who hold that suppuration of the antrum is generally due to causes other than diseased teeth. (*Cosmos*, August 1889.)

The most serious systemic manifestations of pericemental infection are those caused by the absorption of toxins the results of bacterial activity, *i.e.* toxemia; of the ptomains resulting from the action of bacteria on animal tissues, *i.e.* septicemia; and of the

absorption into the blood of pyogenic organisms, *i.e.* pyemia, which may become lodged in any area of the body and give rise to metastatic abscesses. The milder form of toxemia gives rise to chills, fever, headache, general malaise, etc., while the severe forms, as well as pyemia, may end in death.

(16) Patient aged sixty-four; health formerly excellent, but deteriorating, with marked symptoms of pyemia. Three or four years previous had an abscess over the upper left canine, which opened spontaneously, and afterward continued to discharge a sanious secretion. Local medical treatment for a year failed. Examination showed the maxilla from the lateral incisor to the second bicuspid to be involved in caries. Cure followed extraction of the teeth involved and the cutting away of the dead bone, employing sulfuric acid to secure granulation. The antiseptic lotion was used daily, and the reconstruction of bone was complete in thirty days. The health of the patient was speedily restored. (Dr. Porre, Cosmos, November 1887.)

(17) Patient, aged sixty-four, had enjoyed the best of health until within four or five years. His physician, recognizing aggravated symptoms of pyemia, examined the mouth for the cause, as the result of which the patient was taken to Dr. Porre for the operation indicated. Seventeen teeth and roots were extracted, and in ten days afterward the patient had gained six pounds in weight. (Dr. Porre, Cosmos, November 1887.)

(18) Patient had a large cavity filled in the lower left second molar. The tooth became painful in a few days, and so continued with brief intervals for two years, at times involving the whole side of the face. Last November the pain became intensified, and the swelling increased until the left eye was involved, followed by symptoms of paralysis, which, in spite of the best medical attention, finally involved the entire side of the face, when the pain suddenly subsided. The patient experienced the usual functional derangements pathognomonic of pyemia. On account of the enfeebled condition of the patient when referred to the writer, the tooth was not extracted, but the filling was removed, when a liberal exudation of no uncertain odor followed. The tooth was thoroughly syringed with warm water, dressed with an antiseptic lotion, and the patient was dismissed. The improvement in three days was astonishing, and still continued, the promise

being that the tooth would be saved, the paralysis dissipated, and complete restoration to health accomplished. (Dr. Porre, Cosmos, November 1887.)

(19) General prostration, with traumatic lesion of the tongue. Patient's condition was of a low typhoid character. Under tonic treatment he would react for a time, and then relapse. The teeth were found covered with tartar, the gums ulcerating; two teeth were ulcerated and discharging septic fluid; one of them, which inclined inward and had been worn to a sharp edge, continually cut into the tongue, thus actually distributing the virus by inoculation. The ulcerated teeth were extracted, an antiseptic lotion applied, and the patient's medical attendant reported him in better health than for years. (Dr. Porre, Cosmos, November 1887.)

(20) Margaret H., aged twenty-three, a domestic. Family history negative, as also the patient's. She had always enjoyed good health and had a vigorous constitution. Six months previous an abscess developed upon a tooth; there was quite pronounced swelling, also chills and fever. The tooth was extracted without preliminary precautions, and no after-treatment suggested. Two days after extraction she felt a line of tenderness extending from the right side of the jaw, down the neck, chest, and abdomen to the anterior superior spine of the ilium, then extending across to the left side and upward to the twelfth rib, and posteriorly into the left lumbar region. At first there was epigastric discomfort, for which she consulted a physician, and was treated for indigestion, without any benefit.

The patient presented herself for examination April 21, 1905. Physical examination: Patient well developed and perfectly nourished. The heart, lungs, and abdominal organs were found normal. There was a slight swelling in the right groin, with some sense of fluctuation without redness or tenderness. For the past week, on walking, the pain in the right groin had persisted, but was never severe. The urine was negative. Diagnosis: Either intra- or extra-peritoneal abscess. An operation was advised, to which the patient readily consented. It was performed April 23d, under morphin-atropin-ether anesthesia. An inch incision was made, and the appendix veriformis was exposed; as it was found normal it was returned to the abdomen, and the parts were closed very carefully. A second incision was made close to a parallel with Poupart's ligament. An extra-peritoneal abscess was found, opened, and drained of a large quantity of creamy pus. The cavity was washed out, and packed

with iodoform gauze, and the dressings repeated every day until recovery, which was prompt.

On August 23d the patient again presented herself for examination. The hamstring muscles of the left leg were contracted so that the leg was partially flexed. Pain was present, and the patient walked with difficulty. Physical examination: The pupils were equal and reacted well. The mucous membranes were rather pale; no enlarged glands could be detected in the chest, and the heart, lungs, and liver were normal. The kidneys and spleen were not palpable. Evidently an extra-peritoneal abscess was forming in the left iliac fossa. There was pain in the region of the left kidney, evidently due to a lumbar abscess. Under cocaine the tissues were incised down to the left kidney, and a small amount of pus evacuated. From this a pure culture of the staphylococcus albus was obtained, and four days later, under nitrous-oxid-ether anesthesia, an incision was made on the left side above Poupart's ligament, the abscess cavity was opened, and a large amount of pus evacuated. The urine also at this time showed the presence of pus. For a while it seemed as if the patient would recover, but shortly after, evidences of a general toxemia developed, and after a few weeks she died of general septicemia.

Here is a case clearly demonstrating secondary infection through the lymphatics from the primary seat—the oral cavity—in which a young and vigorous woman lost her life from lack of preliminary and post-operative treatment for the removal of a tooth the seat of an abscess. (Dr. D. J. Brown, *Cosmos*, February 1906.)

(21) A boy aged four presented at the time of his admission to the *Hôpital des Enfants Malades*, severe symptoms of infectious nature. The right peri-auricular parotid and angulo-maxillary regions were tumefied and edematous. There was a discharge through the external auditory meatus of some serous, turbid liquid. The diagnosis of septic complications of auricular origin was rejected by Professor Broca, for the reason that while the post-auricular region was of normal appearance and absolutely painless, the area

over the body and ascending ramus was extremely painful to pressure. The diagnosis was consequently changed to osteomyelitis of the jaw.

The interior of the mouth could not be examined, owing to a forced contraction of the masseter and internal pterygoid, caused by the inflammation around the ascending ramus; but the examination of the vestibule alone at once pointed to the cause of the disturbance. From around the gingival margin of the lower right molar pus was being discharged in large quantities. The patient's temperature was about 106°, the pulse small and rapid, and the color of the skin grayish. The urine contained great quantities of albumin.

The surgical intervention consisted in the immediate extraction of the teeth which were the seat and origin of the pyogenic invasion. On the following day, with the patient properly anesthetized, a deep incision was made along the lower border of the mandible. From under the periosteum about two drams were removed of a brownish, fetid, and hematic discharge. The operation improved the local condition, but did not remove in the least the systemic symptoms. The temperature went down about two degrees during the next day, but went up again to about 105°, and on the third day the little patient expired. (Professor Broca, *Cosmos*, July 1905.)

In the discussion of the remote consequences of pericemental infection, the writer's purpose has been simply to call attention, with the assistance of clinical observations, to the necessity of viewing pericemental infection in the light of the serious disturbance which it really is, and not mainly as a purely local disorder. Allusion has been made to only a few of such complications, because the magnitude of the subject would preclude its extensive discussion in a paper the original purpose of which was to review systematically the phenomena of inflammation of bacterial origin in the peridental membrane.

ALVEOLAR INFECTIONS: EXTRACTION VS. RETENTION.

By GEO. B. MITCHELL, D.D.S., Buffalo, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, at Buffalo, N. Y., October 30, 1906.)

THERE has developed during the past few years, not alone in the progressive dental profession, but also in the medical profession, the concept that the oral cavity, instead of maintaining a secondary and inferior position, relative to health and disease, stands pre-eminent as one of the prime factors in the maintenance of health or in the causation of disease.

The field of oral sepsis and oral prophylaxis has developed with remarkable rapidity within the past few years, and bids fair to have a more permanent and serious significance to us, as stomatologists, than any other branch of our art.

There are present today—as of old—in the adult mouth the same, if not more of such factors as lead to oral infections and oral disease, of whose malignancy there is no question, and which until recently were not only overlooked, but also entirely ignored. One instance is the familiar saying, "Bad stomach causes bad teeth," and today we know that the reverse is only too true. The light of more radical and scientific reasoning has dawned upon us, bringing with it the more permanent results in physical prophylaxis and sanitation with which we are more or less familiar.

The profession as a whole has worked prosthesis—the mechanical aspect of dentistry—to a standstill, neglecting its surgical and medical side; with the result to us as dentists that the pathogenesis of systemic disorders, such as dyspepsia, chronic indigestion, diabetes, septicemia, etc., has borne apparently no relation—until lately—to the teeth and adnexa of the oral cavity.

Today one of the necessary qualifications of the dentist is that he should be

familiar with the modes, manners, and ways of pyogenic and other organisms in their relation to the internal organs, inasmuch as clinical bacteriology has demonstrated that practically every part of the body may be affected, and many diseases of the body are caused, by germs which are to be found in the oral cavity in a latent state.

"We must not lose sight of the fact," says Dr. Monnet, "that the mouth is a 'microbic receptacle,' holding microbes from the air, Koch bacilli, pneumococci, staphylococci, sarcinæ, and the special micro-organisms of the mouth—leptothrix buccalis, bacterium termo—and all those salivary micrococci and bacteria which produce septicemia when injected in the rabbit, as shown by Pasteur."

Netter, by his experiments, found that in ten per cent. of all individuals examined at random the saliva contained the staphylococci pyogenes aureus and albus, and that the pneumococcus was present in fifteen to twenty per cent. of the mouths of healthy persons.

It is generally accepted knowledge that oral sepsis is a contributing cause in numerous cases of tonsillitis and influenza—the bacillus of influenza having its breeding-place in the septic mouth.

THE QUESTION OF TOOTH-EXTRACTION DURING INFLAMMATORY CONDITIONS.

It has been the experience of the writer, as well as that of others, to hear a *confrère* remark that he would not extract a tooth during an attack of incipient pericementitis—while the battle was being fought between the leucocytes and the invading bacteria, and before infiltration of the soft tissues had begun. One

wonders at the reason for not extracting. The worthy *confrère*, upon being asked, answers, "Dangerous." "But why dangerous?" you ask, and the reply will be either an indefinite one or a French hunch.

Other *confrères* will tell you or the young practitioner that they never hesitate to extract a tooth at any stage of alveolar infection or inflammation. In the face of so much uncertainty, what should one do and believe? The author knows a score of cases where the attending dentist, and even the physician, refused to extract, and yet when asked for reasons could offer no logical ones.

Such diversity of opinion on this matter and such indecision as to procedure was precipitated upon a meeting of the Buffalo City Dental Association last winter, and the writer then and there determined to find out, if at all possible, what, if any, danger (and why) could accompany the extraction of teeth the seat of abscesses. The opinions expressed by various authors and journals, and the replies to letters written to certain members of high standing in the dental profession constitute, in a general sense, the present paper.

Attention was called to the former stand of non-extraction assumed by Dr. Robt. T. Morris, professor of surgery in the New York Post-Graduate Medical School, who in a recent article entitled "Infection of the Lymph-glands of the Mouth and Throat" (DENTAL COSMOS, June 1904), says:

One class of infections, very dangerous ones, have been frequently overlooked by dentists. . . . These are infections following the removal of abscessed teeth. Patients die and the cases are not reported; they come in [into the hospital] to be treated for pneumonia. There are patients dying this minute in this city from the result of having abscessed teeth extracted while in the course of acute infection; there are cases dying continually . . . not recorded and not discussed, for the reason that they are entered at our hospitals as cases of pneumonia; but they are cases of septic pneumonia, embolic pneumonia, resulting from infection from abscessed teeth. Very often the dentist knows nothing about it. He removes a tooth; he hears, four or five days later, that the patient has developed

pneumonia—believes it to have been a coincidence, thinks his part in the case is not one of consequence, and the patient dies. The case is recorded as a death from pneumonia—not as septic pneumonia from an abscessed tooth.

Let us glance into the oral cavity, and in a general, not microscopical, way make a bacteriological investigation.

REFERENCES IN DENTAL LITERATURE.

The writer finds that dental literature is sadly lacking in reports on cases of infection and death due to extraction, but this deficiency may in no way indicate that such conditions have not occurred, or do not occur at the present time. More nearly is this due to our short-sightedness in matters pertaining to pathogenesis.

According to Vignal and Suckdorf, an adult man passes from thirty to fifty billion of bacteria daily in the feces. Many are harmless in the healthy individual, but, as will later be shown, their virulence is felt after accidents and injuries, such as gunshot wounds, injuries in extraction, shock, catarrhal conditions of the mucous membrane, etc. One is in constant danger of being infected. It has been scientifically demonstrated that every pathological lesion in the oral cavity is due to the attacks of micro-organisms. Our resistance to these micro-organisms depends on the resistance of the tissues to pathological influences, and varies in direct ratio to the degree of health of the individual. The healthier the subject, the greater the resistance of the tissues to invasion, and *vice versa*. Good health is a product of great resistance to microbic invasion.

Goadby says: "It seems not improbable that the various pathogenic bacteria which are today associated with disease were at one time simple saprophytes, as we know them today, and may yet attain pathogenic powers. Not to admit such a development of pathological power entails the obsession that pathogenic bacteria were created by design to destroy human life, and moreover, such a refusal places us at a variance with the monistic conception of the universe and

the orderly operation of the laws of evolution with which all observed phenomena accord."

Vicentini's suggestion that the pathogenic qualities of bacteria are probably acquired, and not necessarily permanent, is shown under the ordinary condition in an epidermis, in the oral cavity, and in the intestines, where many virulent bacteria are present without causing any harm. But give them the suitable conditions for growth—shock, injury, diminished resistance of tissue—such as we find localized in abscessed teeth, and they become disease-producing.

Many undoubtedly remember Dr. Miller's surprising statement of a year or so ago, when he said that the bite of a girl was as deadly as the sting of a venomous serpent. Young men, beware!

Kirk (DENTAL COSMOS, November 1900) shows a culture of the diplococcus of pneumonia, from Miller's specimens, which was found in the blood of a mouse which had been inoculated with a culture from the saliva, thus showing that the blood-stream is a carrying agent for pathogenic organisms. They are undoubtedly harmless until they reach some point of diminished resistance, and there set up inflammation. This point of diminished resistance in our case is the diseased tooth, and the shock or injury of extraction throws the diplococcus into a state of activity.

Farther on, Kirk shows a section of an experimental abscess in the kidney of a rabbit that had been infected by a pure culture of staphylococcus pyogenes aureus, one of the pus-producing microorganisms found in pericemental abscess. The culture was injected into the ear-vein of the rabbit, and established by a metastasis an abscess in the kidney.

In four cases where he secured specimens of the pus from pericemental abscess, the bacteriological investigation showed in each the presence of the diplococcus pneumoniae. A rabbit inoculated with the pure culture of this diplococcus died in ten days, with all the symptoms of the peculiar form of toxemia which is produced by inoculation with the diplococcus pneumoniae.

J. Leon Williams (DENTAL COSMOS, April 1899) reports having found organisms of a diphtheroid character present in a large majority of the mouths he examined, and often where there was no history of diphtheria. Some of the specimens he obtained showed the cross-markings of the Loeffler bacillus, the bacillus of diphtheria—an aerobic, facultative anaerobic, pathogenic organism found in diphtheric false membranes. It is not the so-called "catching" of a disease, as we formerly thought, but the continued presence of these virulent pathogenic organisms in the oral cavity, which gaining control over us when physically below par—as in accidents, injuries, etc.—induce pathologic disturbances.

Robert T. Morris says: "We see cases in which teeth have been removed while there is an abscess of the tooth in an acute, progressive stage, when the abscess is forming. The bacteria are in a state of active proliferation—very active development. If a very small fragment of the bone be broken, the veins of the cancellous structure of the bones fill with thrombi, which, becoming infected, become emboli, and embolic infections follow three or four days after the accident."

D. J. Brown says that healthy oral cavities and their adnexa are especially exempt from infectious processes following injuries, while an oral cavity which is septic from an abscessed tooth-traumatism without preliminary and after-treatment is very dangerous, on account of the possibility of extension of the supuration to some distant part. If a number of micrococci gain entrance into the bottom of the wound, they at once multiply, using the blood-clot and its extensions into the bloodvessels, together with the adjacent dead tissues, as a welcome soil for their development.

He cites the following case: A young lady of twenty-three. History, abscessed tooth of six months' standing, accompanied by swelling, chills, and fever. Tooth extracted without preliminary treatment. Infection manifested itself in two days throughout the neck, chest, abdomen, and anterior spine of the ilium.

Diagnosis, abscess in several places in the body, necessitating several operations, patient finally dying of general toxemia. Dr. Brown says: "Here is a case of secondary infection through the lymphatics from the oral cavity, in which a young and vigorous woman lost her life from lack of preliminary and post-operative treatment for the removal of an abscessed tooth." His other cases show how readily the lymphatics carry bacteria and toxins.

Dr. John Jesensky of Prague reports, in the *DENTAL COSMOS* for July 1901, a case of suppurative inflammation of the upper jaw. Alveolar periostitis was present, and a painful and forceful extraction resulted in an infectious periostitis and osteomyelitis, which spread rapidly through the upper alveolus.

Endelman (*DENTAL COSMOS*, September 1906) says: "The involuntary ingestion of the pyogenic products of pericemental inflammation is, in addition to some well-defined abnormal changes, responsible for the onset of a series of general systemic manifestations which may be regarded in the light of a pneumococcus toxemia, for sufficient clinical evidence has been gathered to prove that, at least in some typical cases of pericemental inflammation, the diplococcus pneumoniae is one of the most conspicuous components of the mixed invasion. The manifestation of this pneumococcus toxemia in the shape of a decrease of vital activity and resistance, with consequent loss of appetite, malaise, lassitude, etc., in turn aggravate the oral conditions, and thus a pathological cycle is established, the consequences of which may vary in severity, from general malaise to symptoms of such an intensity as to endanger the life of the individual thus affected."

Thus we see that the danger of septicemia is ever present in extraction, as it is very difficult to keep aseptic a mucous surface, especially a blood-clot, that is constantly bathed in septic matter and pathogenic micro-organisms. Septic blood conditions have been observed in pyorrhea of the nature of those occurring in carcinoma.

D. C. Sabatier, in an exhaustive study of septicemia of bucco-dental origin (*DENTAL COSMOS*, June 1904), among many statements says: "It has been observed that serious complications follow occasionally lesions of the teeth and suppuration of the gingivo-dental region and stomatitis, owing to a systemic intoxication by varieties of microbes or their toxins. . . . These intoxications, which belong to the type of septicemias, may be of the following varieties: (a) Chronic septicemia, almost always consecutive upon prolonged suppurations of the gingivo-dental region. (b) Acute septicemia which are stages in the course of chronic septicemia or else true acute attacks following surgical interventions or other causes which render the organism more vulnerable. . . . In the majority of cases, the progress of acute septicemia is fatal. . . . The possibility of severe intoxications following suppuration of the gingivo-dental region explains the necessity of combating by all the means at our disposal any suppuration, whatever be its degree of intensity."

Morris says that as a general principle, the greatest danger of surgical intervention is at a time when bacteria are rapidly proliferating. He has seen two or three cases of infections in the course of a week, resulting from the removal of teeth the seat of acute alveolar abscess.

Dr. Wm. Hunter, in articles published in the *British Medical Journal*, says that oral sepsis is of a particularly virulent character. An extensive pathological experience has satisfied him that no pus-organisms are so virulent as those which are instrumental in the causation of necrosis, and how frequently do we find necrosis in our extractions.

Morris is quoted as saying that there is no operation in minor surgery that is so fatal as the extraction of lower molars, especially the third molars the seat of acute alveolar abscess.

C. A. Harmann, M.D., reports three cases of suppurating sockets of teeth, resulting in submaxillary and parotid infection, followed by septic thrombosis of the cavernous sinuses and death. His ex-

planation of the path the infectious process follows in these cases of extension from the teeth to the cavernous sinuses is interesting. He says: "The veins which return the blood from the teeth pass to the pterygoid plexus, which is situated about the pterygoid muscles and in the fat of the cheek. This plexus communicates with the cavernous sinus by means of small veins, which pass through the foramen Vesalii, foramen lacerum medium, foramen ovale, and along the internal carotid artery; in addition to this, there are connections between the plexus and the inferior ophthalmic vein, through the spheno-maxillary fissure. The ophthalmic vein empties into the cavernous sinus. Given, then, a suppurative process about the teeth, such as pyorrhea alveolaris, an alveolar abscess, or indeed any septic process about the jaws or face, it is easy to see how extension to the sinus may occur. If the sinus is thrombosed, the ophthalmic vein of course cannot empty itself, and consequently the blood is retained in the orbit and the eyeball is pushed out—the pathognomonic sign of cavernous sinus thrombosis. Thrombosis [septic] in the cavernous sinus is practically always fatal."

He also cites a case of fatal sepsis following the extraction of a molar upon the pericementum of which an abscess had developed. Death was due to thrombosis in the cavernous sinus.

Inflammatory phenomena resulting from infection of the alveolus subsequent to the extraction or by the retention of the abscess sac are usually accompanied by pain. Infection in such cases may follow from three to four days after the extraction.

In the DENTAL COSMOS for October 1906 is an abstract from *Semaine médicale*, giving a case of death following the extraction of a tooth under cocaine and adrenalin anesthesia, the case having been reported by Dr. Maragliano, of the Faculty of Medicine, Genoa, Italy. The tooth was extracted owing to a severe attack of alveolo-dental periostitis. On the following day there was intense fever, and in addition the gingival tissue presented the appearance of having be-

come the seat of an active necrotic process. Symptoms of intense purulent infection soon appeared, and culminated in the death of the patient, which occurred eight days after the extraction. The reviewer (Cosmos, page 1061) says: "Although the extraction of a tooth during or shortly after an acute attack of pericemental infection is *per se* ample cause to account for a fatal termination, Dr. Maragliano opines that the accident might have been averted had the extraction been performed without the therapeutic assistance of the cocain-adrenalin solution. To the reviewer such a view of the case seems hardly plausible. The nucleus of infection was present before the injection was performed, which at the utmost could only have intensified the inflammatory process. . . . Fatal cases traceable to pericemental infections are not so rare as the author seems to imply, and many just such cases as the one here reported can be found recorded in medical and dental literature. The severity of the symptoms and the fact that death did not occur until a week after the extraction point strongly to septicemia of dental origin as the paramount cause of the fatal termination."

Dr. Low, in discussing Dr. Morris' paper, before quoted, thought that the difference of opinion as to the immediate extraction of the abscessed teeth might possibly come from the fact that in private practice we see a different class of patients from that of a hospital clinic, the latter being, as a rule, physically below par. But even if grave danger be imminent with extractions only in public clinics, we should not dismiss the subject lightly. Anything less than our best efforts may result in severe injury. We all have the physically deficient in our practices, rich and poor alike.

ANSWERS OF VARIOUS PROMINENT MEN TO CERTAIN QUESTIONS.

Letters were addressed to Drs. G. V. Black, G. V. I. Brown, E. C. Kirk, R. H. Hofheinz, R. Ottolengui, T. W. Brophy, H. J. Goslee, F. B. Noyes, C. M. Paden, Frank French, and M. I.

Schamberg containing the first extract [see page 709] from Dr. Morris' paper—the relation of extraction to pneumonia—and the following questions:

I. What, from your experience and observation, is your opinion of the above?

II. Do you (or did you) ever hesitate to extract in cases of pericementitis and alveolar abscess, or any acute alveolar infection?

III. If so, in what instances and for what reasons?

IV. Do you differentiate in extraction between pericemental or alveolar infections caused by colds and those due to other causes?

V. In your experience, do you think there is any danger (as per extract) attending extraction at any stage of alveolar infection?

VI. If so, what dangers, and for what reasons?

Dr. G. V. Black.

Dr. Black's answer is as follows:

I suppose this is a continuation of the discussion that has been going on for years, certain writers and clinicians opposing the extraction of teeth during the acute periods of alveolar abscess. My experience and observation seem to warrant me in saying that whenever dangerous symptoms come up in the course of alveolar abscess, the most certain way of abating them is to at once extract the teeth concerned. In saying this, I do not wish to infer that this will in every case relieve the symptoms or bring about a radical cure of the case, but the rule is, that it is the safest procedure. It is usually the continuation of severe inflammatory and suppurative processes that causes wide necrosis of bone and septicemia, and in my observation the occurrence of septicemia, particularly, is the most dangerous feature of alveolar abscess.

As to pneumonia occurring from these infections, I have no knowledge, having never seen a case, and should not say that such a thing is impossible; yet taking all the circumstances into consideration, it does seem rather improbable. I have had personal knowledge of three cases of abscess of the lungs resulting from the injection of carbolic acid for the radical cure of piles. In these cases the carbolic acid was injected into a mass of loose and very vascular tissue; probably coagula at once entered the veins and were conveyed to the heart, and from the heart to the lungs, where they lodged. The chances for such an occurrence from alveolar abscess are not nearly so good as they would

be from such tissue as that in which the carbolic acid was injected. In these cases of alveolar abscess the tissues are filled with the inflammatory products, and the vessels for the most part are closed, giving conditions which are exactly the opposite of the cases I have stated, in which the floating away of coagula in the blood-streams would be least probable, and certainly would occur least often. While this seems to me the case, it may be possible that I have overlooked cases of pneumonia—or so-called pneumonia—resulting from the transplantation of micro-organisms to the lungs, but it is difficult to think that this should occur in any considerable number of cases without there having been more explicit observations of them.

In your fifth question you ask, "Do you think there is any danger attending extraction, at any stage of alveolar infection?" I will say in answer to this that there is often danger of septicemia resulting from alveolar infection. I think that the extraction of the teeth in these conditions is the best way to avert the danger, though it may not always be successful. *As to the general subject, I will say that there are quite a number of deaths occurring from infections in connection with alveolar abscess that are not being reported as such.* [Italics mine.—G. B. M.] So far as I am able to get the history of these cases, and to judge from my own observations, they are all deaths from septicemia. Several have occurred in Chicago, and I have reports of a number of others; in my practice death has been very narrowly averted in a considerable number of cases. All of these have taken on the phase of septicemia, and in none of them, that I know of, has lung trouble of any kind formed a principal item in the conditions found. The danger to life from alveolar abscess is not at all sufficiently recognized, and in my opinion, deaths occurring from this cause should be carefully reported with all the attendant symptoms, until such time as the dental profession, and the medical as well, recognize these dangers and the particular directions that the malady induced takes.

Dr. E. C. Kirk.

Dr. Kirk's letter is as follows:

In the first place, the statement quoted is a very general one, and would have been more satisfactory—and I may say of more scientific value—if the author of the paper had cited cases of this character in which the indications were sufficiently strong to leave no reasonable ground for doubt that the fatal pneumonia arose from an infection via the abscessed teeth; and it would have been still

more interesting and important if he could show by cases that it was the operation of extraction of the abscessed teeth that led to the lung infection, and that it was not the inflammatory condition that necessitated the extraction of the teeth which was the cause of the lung infection.

It has been pretty clearly made out through bacteriological researches, first, that the pneumococcus is a nearly constant inhabitant of the human mouth; some authorities assert that in as high as eighty per cent. of human mouths the pneumococcus is to be found; and it is still further pretty clearly made out by laboratory research that the pneumococcus is one of the principal exciters of inflammatory conditions in the pericemental membrane, and that the infection of the pericemental membrane may, and usually does, take place via the pulp-canal, when that canal is exposed; and that it may take place through the blood-current, or possibly through the gingival margin, in cases where the pulp-canal is not open, but where we have that type of abscess which has been called pericemental abscess—that is to say, abscess upon teeth with living pulps. The pneumococcus is apparently the exciter of the initial pericemental inflammation, and when the inflammation is once lighted up, the bacteria of pus-formation invade the tissue, forming a true abscess. Under these conditions, as you will see, an inoculation of the tissues by the pneumococcus has occurred even before the tooth is extracted, and it is questionable to my mind that the extraction of a tooth under conditions of active inflammation from such an infection adds one iota of danger to the subsequent infection of the lung. On general principles I am of the opinion that it is good surgery to remove such an abscessed tooth, because its infected pericemental membrane is the focus of inflammation, and because in the majority of cases the removal of a tooth which is the focus of infection tends to relieve the inflammation; or, otherwise stated, on general principles I am of the opinion that in cases where a secondary pulmonary infection occurs, it would happen equally whether the tooth were extracted or not. It is good surgery and rational therapeutics to remove the source of infection in all cases, and I cannot see that the retention of the tooth would reduce the chances of the pulmonary infection in any case where it was likely to occur from a dental origin.

I never have known of a case where I could reasonably trace out a connection between a dento-alveolar abscess and subsequent pneumonia. I have, however, seen cases of extensive necrosis of the lower jaw, with exfoliation of a considerable portion of the alveolar

border and loss of a number of sound teeth, due to infection from the pneumococcus, and where that organism was definitely determined by well-known research methods to have been the exciter of the necrotic inflammation, and where the original point of entry was through the open canal of a carious tooth.

You will see from the foregoing that I cannot take the ground which the author of the extract appears to take—that there is danger in the extraction *per se*. I should no more hesitate to extract an infected tooth than I would to remove a splinter which was the carrier of infection and cause of suppuration somewhere in the tissues of the body. There is a very palpable danger in cases of extraction during abscess of a tooth that the extractor may be charged with causing the infection, because the removal of a tooth does not, in all cases, cure the abscess.

Dr. G. V. I. Brown.

Dr. Brown's letter is as follows:

No. I. I heartily agree with the statements of Dr. Morris, and am glad to see attention called to the more serious aspect of diseases of the teeth and alveolar structures in relation to fatal results. My own work being almost wholly confined to hospital cases, such conditions as the extract refers to naturally come under my observation more than ordinarily would be the case in office practice; and I have constantly endeavored, during the past few years, to bring forward the idea of the fatal possibilities that lie directly in line with many pathologic affections that dentists commonly undertake to treat. The only criticism that might be made with regard to the extract is the fact that it lays so much stress upon pneumonia, when, as a matter of fact, the pneumococcus and its direct results are only a part of the pathogenic enemies to be feared. How many lives dentists could have saved with a better knowledge of pathology will never be known. How many they may save can only be discovered by actively bringing forward the urgency of such considerations, and as your questions appear to be most timely in leading in this direction, it gives me pleasure to answer as fully as possible under the circumstances.

My answer to No. II must be—Yes, subject to explanations of No. III.

In question No. III one must differentiate between acute and chronic conditions; between those in which there is general manifestation of toxic influences; between cases in which large gatherings of pus can readily be evacuated without exposing freshly open

vessels to infection, as might be the case under immediate extraction, and between those patients in whom blood examination shows marked deficiency of those elements upon which dependence must be placed in battling against septic dangers. Often the question is a very difficult one to decide, *i.e.* whether the danger is greater in allowing the direct cause of irritation and infection to remain while other measures are employed to give relief, instead of resorting to immediate extraction, or whether the complete removal of the exciting cause would give more prompt relief, and in the end be safer.

Question No. IV does not appear to be quite clear.

Question No. V appears to have been already answered. No. VI is partly answered by the cases quoted in the inclosed reprint, in two of which the patients died from what appeared quite insignificant causes. In one case the trouble began in the region of the third molar, and ended in coma and death. In the other case there was no more serious appearance than that of ulcerative stomatitis and pyorrhea alveolaris, yet each organ of the man's body showed round-cell infiltration and degenerative processes similar to those shown in sections taken from the mouth. One other case, a more recent one, might properly be reported in this connection. A man came to me for operation at my clinic at the University of Iowa. I refused to operate unless he would delay it long enough to enable blood, urine, and other examinations to be made. He went to a general surgical clinic in order to have immediate operation for the cure of what appeared to be a disturbance of the lower incisors, with necrosis of the surrounding alveolar structures. A general surgeon undertook the case and performed the operation at once, with the result that the patient died upon the operating table.

Undoubtedly, in vast numbers of cases with conditions of otherwise reasonably good health upon the part of infected individuals, the most prompt and efficient method of giving relief is by removal of the direct cause of infection, whether it be tooth or alveolar structures; but when the blood examination shows that the hemoglobin is lower than normal, and the blood corpuscles are disarranged in their numerical proportions to a degree indicative of disease; or when temperature and pulse or urine or bacterial conditions present indications of serious pathologic disturbance, the question of these or other physical signs of diminished bodily resistance must be weighed carefully against the local demands for immediate intervention. It is my invariable practice, wherever possible, to have such examinations made in cases where the symptoms

indicate rather serious conditions. This has been a great safeguard to me, and I know of no other means by which one may safely arrive at a true understanding of individual conditions upon which a decision as to the method of procedure must be based.

Dr. R. Ottolengui.

Dr. Ottolengui's letter is as follows:

In reply to your inquiries regarding extraction of teeth in the presence of pericementitis and alveolar abscess, I beg to state that in my opinion the tooth should be removed, and I should not hesitate to do so. I do believe, however, that Dr. Morris has issued a word of warning that might well be heeded by the profession. One trouble of the present status is that a number of men send extracting cases to a specialist. The dentist seems to think that his care of the case ceases with the recommendation. On the other hand, the specialist too often dismisses the patient after extracting the tooth and receiving his fee. The result is that the wound receives no after-care. In my practice, when I send a patient to a specialist for the removal of a tooth, I either have it definitely understood that he is to continue the treatment of the case until the wound is healed, or I take charge of that portion of the work myself. In other words, the removal of a tooth, especially in the presence of infection, demands the same surgical after-care as would be accorded to similar conditions elsewhere in the body.

Dr. R. H. Hofheinz.

Dr. Hofheinz's letter is as follows:

In answer to your questions I beg to say—

(1) That there is infinitely more danger in leaving an abscessed tooth in its socket too long than there can be in its removal.

(2) I should never hesitate to extract in cases of pericemental or alveolar abscess, providing I could not by other means restore the surrounding tissues to a normal condition.

(3) Causes of all pus-formation should be well and carefully differentiated. If due to a local affection, cure can certainly be much easier obtained than if it were due to a systemic diathesis.

(4) I can see no danger in extraction; it means in most cases simply the removal of the cause—the rational treatment of all diseases.

Septic pneumonia, embolic pneumonia, if at all due to abscessed teeth, are not due to the extraction of the diseased teeth *per se*. They are due to the fact that the teeth were

not extracted in time, thus allowing the pus to be absorbed, and to produce a remote septic condition.

Dr. M. I. Schamberg.

Dr. M. I. Schamberg replies as follows:

I was present at the meeting at which Dr. Robert T. Morris read the paper from which you have taken the extract quoted in your letter. In the discussion of the paper, my remarks were in opposition to the views of the essayist in regard to the danger of removing abscessed teeth during the acute stage, and I am still convinced, owing to many cases which I have seen, that more harm will result from the advocacy of the retention of such teeth than from their prompt removal. Unfortunately, Dr. Morris' statements in regard to the frequency of deaths following extraction are irrefutable, but he has not arrived at the actual cause of these fatal terminations. Death in such cases occurs in spite of the removal of the cause of infection, rather than because of it. Teeth are retained for too long a period, in an attempt to await the passing of the acute stage, during which time the suppuration makes more progress, and the system of the patient becomes undermined. Septicemia and pyemia are the natural results of the prolonged retention of pus. It is an interesting observation that Dr. Morris has made, that such cases exhibit evidences of embolic pneumonia.

I never hesitate to extract a tooth because of an acute infection, if I am reasonably sure that the tooth should be sacrificed. If an acute abscess can be induced to subside, and the tooth be conserved by an incision of the gum tissue or a puncture of the process, I believe this to be the best means of dealing with abscesses during the acute stage; not because I fear the consequences of taking out the tooth, but rather to save what may be a valuable masticating organ. To say that "the extraction of a tooth during the active process of inflammation or suppuration is without danger" would be a mis-statement, unless it were added, 'providing the case was handled as the careful surgeon would treat any other inflamed or infected wound.' Complications will arise in the extraction of teeth so long as operators fail to realize the importance of dealing with this operation as similar conditions are handled in other parts of the body.

CONCLUDING REMARKS.

There has been, and there is today, a general lack of sterilization of the oral

cavity before and after extraction. To the knowledge of the writer, no anti- or post-extraction sterilization of the mouths of the patients is insisted upon in our colleges. In the eight years of his dental experience, he has yet to see the practitioner who sterilizes instruments and field of operation before and after extraction. To neglect this important operation is criminal malpractice. One must instruct the patient as to the proper care after extraction. The extraction of a diseased tooth surrounded by diseased tissues is a source of great danger to the patient. If you send the latter to a specialist, see to it that either the specialist or yourself treats the wound as a surgeon would. Patients are more lax in returning after extraction than after any other operation.

The idea that the saliva is in any way germicidal is an erroneous view, as has been brought out by Miller's experiments. They have established the fact that neither the oral fluids nor their separate constituents (mucus, potassium sulfocyanid, etc.) have the power to arrest or even perceptibly retard the growth of bacteria.

"Aseptic surgery is the only surgery known today by men of established reputation. It is just as true of the dental as of medical work. Those who adopt it least will always be the last." The writer does not wish to step into the field of oral prophylaxis, but is of the opinion that that field has just awakened to its infancy. We do not know, cannot see, nor are we able to realize the tremendous benefits to humanity that oral prophylaxis will accomplish in the future. The public will come to us as a profession for preventive medicine, and we will then be the professional men *par excellence*. Our field is going past that of medicine in its relation to humanity's welfare. We are going to prevent illness, not cure it after it has arrived.

En résumé, we see that it is often a very serious affair to extract teeth the seat of pericemental infection; that there is danger of systemic infections and

death, and that the determination of the cause of the infection is a matter of careful diagnosing. When an infection is developing in the alveolus or contiguous membranes, the micro-organisms proliferate rapidly, and we should be careful not to injure or shock the focus of infection before the period of active phagocytosis. The proper time to extract, if extraction be found advisable, is when either side, bacteria or leucocytes, is shown to have been the victim, as is evi-

denced either by tissue infiltration on one side (bacteria winning) or diminished periostitis on the other (leucocytes winning).

Let us do away with any possibility of infections by cautious diagnosis and aseptic surgery.

The writer disclaims originality in this paper, but ventures to hope that it may stimulate thought and action upon a problem of such great importance to the profession, and above all, to humanity.

RECREATION FOR THE DENTIST.

By B. HOLLY SMITH, M.D., D.D.S., Baltimore, Md.

(Read before the Southern Dental Society of New Jersey, Camden, May 15, 1907.)

WEBSTER gives as a definition of recreation, "The art of re-creating; the state of being re-created; refreshment of the strength and spirits after toil; amusement; diversion; sport."

Accepting this as my definition, I make no apology to your society for the selection of the topic of this paper. While I am willing to defer to those who advocate a strenuous devotion to duty on the part of members of our cult, I am here to contend that "strenuous devotion" to duty comprehends in a broad sense a devotion to the protection of these bodies and minds of ours, and the re-creation of the tired, worn and fagged remains into a joyous, courageous, and wholesome body and spirit.

In order to approach the subject so that application of my contentions may be made to dentists, I make the statement that from my observation dentists are the hardest-worked professional men of whom I have any knowledge; that they work under more trying circumstances and for longer hours. A hard day at the chair will take more out of a man than will anything I know of; and yet the careful and successful practitioner must recognize that in each successive opera-

tion the operator should feel and be at his best, or failure may result. Let us compare his work with that of some other specialists.

The oculist, or the throat and nose specialist, between the hours of 9 A.M. and 1 or possibly 2 P.M., sits in his chair making examinations, and wielding his spray, applicator, curette, or knife. Possibly, after an hour for lunch, he may spend one or two hours in the afternoon at the hospital or infirmary. His patients follow each other in rapid succession, none of them staying longer than a few moments, and he charges a fee of from two to five dollars for each treatment. The gynecologist and the general surgeon operate for only a few hours of the day, and usually they are surrounded by an army of assistants and nurses, who aid them in their operations and assume entire charge of the patients. The general practitioner of medicine may have longer hours, but between calls he has the grateful outdoors, the relief from the monotony of one room, and he lives in an atmosphere of adulation; he is constantly made to feel that he and God are the great dispensers of healing and comfort. I do not deny that his heart

is often wrung by the suffering of his patients, but in general he does what he can, and is possessed of an easy conscience and a serene mind.

THE STRAIN UPON THE DENTIST.

How is it with the dentist? The average city dentist operates from 8 or 9 o'clock A.M. to 5 or 6 P.M., with a brief half-hour for lunch, and he does this six and (more's the shame!) sometimes seven days a week. He spends his entire working time in an atmosphere of tension; for say what you will about "painless dentistry"—about kind and gentle treatment—the average patient of today has not outgrown the dread commonly entertained yesterday of dental operations. The attitude of mind and body is seldom natural, and the practitioner is often sorely taxed to restore comparative composure, or an equilibrium which will allow the patient to submit to the tedious and difficult operation. This mental condition of the patient is no small factor in the wear and tear of a day's work, for who can deny that, if it were equally pleasant to patient and operator, great restfulness and delight might be gotten out of the successful accomplishment of an operation. The evolution of graceful and natural forms under the manipulation of our fingers, and the restoration to normal type of marred and faulty conditions in the oral cavity, are more than interesting. The joy of recreation is a great and lasting joy, and it is in a measure a great source of stimulus and inspiration in the average day's work. Its accomplishment, however, is often made impossible by the nervous condition of the patient, and then the sorrow of not having done the best adds greatly to the weight of the care of the day.

Again, the dentist, however careful, cannot perform his daily task under the most salutary conditions. Do what he will as to ventilation, he is constantly inhaling the exhalations of his patients; he is often uncovering and liberating mephitic gases, or is inhaling breaths freighted with the products of suppura-

tion and decomposition in catarrhal and other inflammations—not the least disagreeable of which is found in the mouths of pyorrheal patients.

It must be remembered that during all these long hours the dentist is standing in a strained and unnatural attitude, often on one foot, pedaling the engine with the other. He is constantly taxed by the necessity of focusing his sight and the effort of adapting his fingers to a small area. He spends his days in trying to keep his patient in just the right position; the mouth open just so much; the patient quiet; the tongue out of the way; the site of the operation free from moisture, etc. Is it any wonder that six or even seven o'clock finds him "all in"—and, in some instances, trying to restore normal tone by resort to stimulants?

In observations extending over twenty-six years, I have found some of the brightest and best men of my acquaintance broken in health and periodically incapacitated for service; old and worn, and—as a classmate of mine recently expressed it to me in speaking of himself—with little or no heart for their work, and no capacity for the enjoyment of life. Sad as it may seem, we are forced to the conclusion that the working life of a dentist is of short duration. The medical practitioner is esteemed and respected even though the frost of age may have left its mark in his hair; he may totter on his feet and stumble in his speech, but his patients will yet love him and patronize him. Not so with the dentist; his efficiency impaired, he is quickly discarded. Aside from these considerations, the overworked, the too-much-taxed practitioner, is a prey to every ailment; he loses time because of illness, accomplishes his tasks with great difficulty—and who can suppose he does them as well! He is often not really fit. No one is more exacting as to the fitness of his instruments and machinery, but many times he is indifferent to the demands of nature, and makes no conscientious effort to conserve his vital forces. In the last year I have known of a score or more active practitioners, about my age, who

have completely gone to pieces because of overwork. In many of these instances these men were originally possessed of magnificent constitutions, country reared, and well equipped physically for life's battle; but being either ignorant or indifferent to their limitations, they forced themselves into a state of nervous collapse—a condition not quickly, if ever, recovered from.

With this rather gloomy picture I might readily be open to the charge of pessimism if I had no solution to offer, but I think I have. Most of us have conducted our practices along the lines adopted by those with whom we were associated when we began; or we are guided by the customs prevailing in the offices of our present professional associates. Again, the demands made upon us by our patients are shaped largely by what is commonly expected of the dental practitioner. He is supposed to have certain office hours because his brother dentists have. Did anyone ever hear of a patient who could not consult a throat specialist because his office hours lasted only until 1 P.M.? Yet how often it is made to appear that a dentist must wait even after his belated closing hour to suit the convenience of some unreasonable patient.

THE BETTER WAY.

This is all wrong, and self-preservation demands that the dentist shorten his office hours. Let him begin at 8 A.M. and work until 2 P.M., for two or three afternoons in the week, and until 3 or 4 P.M. the other days. I have done this ever since I began the practice of dentistry, except that in the winter months I have worked for two afternoons until 4.45.

Again, I would advise against undertaking any major operations after half-past 1. The time after that can be well spent in plastic work, treatments, and attention to orthodontia patients. It is perfectly easy to make this division or assortment of patients, and by so doing difficult operations are gotten out of the way before one begins to flag. They then are done at the time they can be well performed—when the operator is at his

best. I flatly say to my patients when I am requested to do a major operation in the afternoon, "I never do other than minor operations in the afternoon," and that settles it.

Now, I know as well as anyone that if by accepting this plan the income of the office is to be abridged, its proffer is worse than useless. The dentist is not sufficiently well paid, and it is largely his own fault. No other specialist but who charges for the simplest consultations, yet many dentists change treatments and adjust appliances without making any charge on their books. This is manifestly unfair. No one has any right to take five minutes of the dentist's time without paying him a fee. With one dollar as the minimum fee, the ten or a dozen stragglers and seekers of minor attention may be made to pay for the one or two hours wisely taken in the afternoon for recreation. And what shall this recreation be—or rather, how shall it be accomplished? By an hour or two at the club? A rubber or two at bridge whist, pitch, or pinochle, or bowling, billiards, or pool? Attendance upon lectures on psychic research, philanthropy, surgery, medicine, municipal conditions? These are all useful, broadening and helpful, but are not recreation for the closing hours of the day. There may come a time for the indulgence in some or all of these, but my contention is that if the dentist will fit himself for his work he will then be fitted for these, occasionally. Therefore it should be his object, as it is to discharge his duty to his patients, to get *some* outdoors every day, and more most days. Let him make friends with the "friendly forest,"—study it intelligently, know its members by name, and visit them often;—watch the unfolding of their leaves in spring, and bask under their leafy shade in summer;—feel a personal interest in individual trees, love them enough to embrace them, to get some part of their mysterious life, growth, and helpful beauty;—find out their secrets and the secrets of their companions. Van Dyke says:

"There are three vines that belong to the ancient forest. Elsewhere they will

not grow, though the soil prepared for them be never so rich, the shade of the arbor built for them never so closely and cunningly woven. Their delicate, thread-like roots take no hold upon the earth tilled and troubled by the fingers of man. The fine sap that steals through their long, slender limbs pauses and fails when they are watered by human hands. Silently the secret of their life retreats and shrinks away and hides itself. But in the woods, where falling leaves and crumbling tree-trunks and wilting ferns have been molded by Nature into a deep, brown humus, clean and fragrant,—in the woods, where the sunlight filters green and golden through interlacing branches, and where pure moisture of distilling rains and melting snows is held in treasury by never-failing banks of moss,—under the verdurous flood of the forest, like seaweeds under the ocean waves, these three little creeping vines put forth their hands with joy and spread over rock and hillock and twisted tree-root and moldering log, in cloaks and scarves and wreaths of tiny evergreen glossy leaves.

"One of them is adorned with white pearls sprinkled lightly over its robe of green. This is *snowberry*, and if you eat of it you will grow wise in the wisdom of flowers. You will know where to find the yellow violet, the wake-robin, and the pink lady-slipper, the scarlet sage and the fringed gentian. You will understand how the buds trust themselves to the spring in their unfolding, and how the blossoms trust themselves to the winter in their withering, and how the busy hands of Nature are ever weaving the beautiful garment of life out of the strands of death, and nothing is lost that yields itself to her quiet handling.

"Another of the vines of the forest is called *partridge-berry*. Rubies are hidden among its foliage, and if you eat of this fruit you will grow wise in the wisdom of birds. You will know where the oven-bird secretes her nest, and where the woodcock dances in the air at night; the drumming-log of the ruffed grouse will be easy to find, and you will see the dark lodges of the evergreen thickets inhabited

by hundreds of warblers. There will be no dead silence for you in the forest any longer, but you will hear sweet and delicate voices on every side—voices that you know and love; you will catch the keynote of the silver flute of the wood-thrush, and the silver harp of the veery, and the silver bells of the hermit; and something in your heart will answer to them all. In the frosty stillness of October nights you will see the airy tribes flitting across the moon, following the secret call that guides them southward. In the calm brightness of winter sunshine, filling sheltered copses with warmth and cheer, you will watch the lingering bluebirds, robins, and song-sparrows playing at summer, while the chickadees and the juncos and the cross-bills make merry in the wind-swept fields. In the lucent mornings of April you will hear your old friends coming home to you—phoebe, and oriole, and yellow-throat, and redwing, and tanager, and catbird. When they call to you and greet you, you will understand that Nature knows a secret for which man has never found a word—the secret that tells itself in song.

"The third of the forest vines is *wood-magic*. It bears neither flower nor fruit. Its leaves are hardly to be distinguished from the leaves of the other vines. Perhaps they are a little rounder than the snowberry's, a little more pointed than the partridge-berry's; sometimes you might mistake them for the one. sometimes for the other. No marks of warning have been written upon them. If you find them, it is your fortune; if you taste them, it is your fate.

"For as you browse your way through the forest, nipping here and there a rosy leaf of young wintergreen, a fragrant emerald tip of balsam fir, a twig of spicier birch, if by chance you pluck the leaves of the wood-magic and eat them, you will not know what you have done, but the enchantment of the tree-land will enter your heart, and the charm of the wild-wood will flow through your veins.

"You will never get away from it. The sighing of the wind through the pine trees, and the laughter of the stream in

its rapids, will sound through all your dreams. On beds of silken softness you will long for the sleep-song of whispering leaves above your head, and the smell of a couch of balsam boughs. At tables spread with dainty fare you will be hungry for the joy of the hunt, and for the angler's sylvan feast. In proud cities you will weary for the sight of a mountain trail; in great cathedrals you will think of the long, arching aisles of the woodland; and in the noisy solitude of crowded streets you will hone after the friendly forest. This is what will happen to you if you eat the leaves of that little vine, wood-magic."

Maybe the dentist will never taste of these beauties, and yet may have opportunity to indulge in some fad of raising roses, shrubs, or trees. Then let him say with Whittier:

I know not how in other lands
The changing seasons come and go;
What splendor falls on Syrian sands,
What purple lights on Alpine snow!
Nor how the pomp of sunrise waits
On Venice at her water-gates;
A dream alone to me is Arno's vale,
And the Alhambra's halls are but a traveler's tale.
Yet he who wanders widest lifts
No more of Beauty's jealous veil
Than he who from his doorway sees
The miracle of flowers and trees.

To those who cannot have their plot of ground, and whose urban life denies a "sub," let me advise golf. Every city affords opportunity for membership in a golf course, and the game tends to a forgetfulness of all else. With his feet treading the soft, velvety grass; his eyes restfully contemplating the broad expanse of green sward; his arms and body engaged in the comfortable exercise and friendly competition of the game, and

his lungs refreshed by the pure air of heaven, the fagged and weary man is made over. Two hours at this will set him up for the day to follow, and give him some appreciation of the benefits of sleep—"Nature's sweet restorer." And right here let me say that the man who knows he has a hard day's work before him has no business with late hours. As with the athlete, the dentist in preparing for his daily contest must keep training hours and remember the morrow when much is expected of him. Dr. Osler once said, in effect, that by the greetings of students at the breakfast table one could tell what time they went to bed the night before. The buoyant courage in the one offset by surly discontent in the other made it easy to distinguish the early from the late bird.

And then let us understand that this is not to be simply a physical recreation, for what body could be fresh and ready for toil with flagging and drooping spirit? The physical giant has been known to falter and fail because his heart was not in the task—his spirit was stale. Not so those who go to nature for their refreshment and recreation. God has planted in the human heart a mighty interest in His wondrous works. Man's spirit, fretted into turmoil by the combat of the day, worn by futile effort, depressed by failure or limitations, finds rest and recreation in the contemplation of the broader and more generous scheme of nature, where the lark and the eagle, the lily and the rose, contribute alike to make up the grand concord.

How good is man's life—the mere living!—
how fit to employ
All the heart and the soul and the senses
forever in joy!

Let one more attest—
I have lived, seen God's hand through a lifetime;—all was for the best.

THE USE OF COMPRESSED AIR IN THE OFFICE AND LABORATORY.

By WILLIAM W. BELCHER, D.D.S., Rochester, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, held at Buffalo, N. Y., October 30, 1906.)

THE use of compressed air in dentistry is not new—just how many years ago the pneumatic mallet was first introduced I am unable to say. The mallet was attached to the head of the foot engine, and for the condensation of gold gave a very satisfactory soft and rapid blow; operators who used it claim it was the most satisfactory instrument for the purpose devised up to that time; but with the advent of the automatic, electric, and engine mallets, it passed out of use. There was also the pneumatic engine, which was operated by foot power, the compressed air acting on a suitably shaped wheel, much like that of the modern water motor; but eventually this also was abandoned.

Any method, no matter how much virtue it may possess, must be handy in its application—a requisite which the early mallet and engine lacked. To illustrate this point let us instance our use of the encyclopedia and the dictionary—two most useful adjuncts to our civilization. Unless they be handy these aids are not used to the fullest extent. If the encyclopedia be in an adjoining room—if two glass doors have to be opened each time it is needed—if the dictionary have two books piled on top of it—it will not be used to the extent it would be were access to it easy and without effort.

To get the full value of a compressed-air outfit, it must be as handy as the turning of a water faucet; the tube conveying the air must be as easy to reach as the water or air bulb. If the operator has to stop and compress the air by hand, or if the pressure varies and is not ready at all times, the outfit will not be used. This brings us to the question of equip-

ment. For compressing air, electric, water, mechanical, and hand pumps may be employed. The electric pump is expensive to install and to operate, but in localities in which the water contains large quantities of sand, it is the most efficient of any pump. The mechanical pump is attached to the laboratory lathe, or other revolving machinery, and the supply of air for the day or hour is pumped into a proper tank. The hand pump is efficient, but laborious, and likely to be in need of attention at the most inconvenient times. Both the mechanical and the hand pumps are inexpensive, but lack in handiness. To my mind an air-compressor should be automatic and ready at all times, without any personal effort; this is the case with an efficient electric or water pump.

Personally I prefer a water pump connected with the water mains. The water pump, or as it is sometimes called, the beer pump, is automatic, and requires but little attention. The pressure in the tank may be regulated so as to be from five to ten pounds, or the full amount of the water pressure. I find from five to ten pounds' pressure sufficient for all needs. The pressure may be cut down by the regulator supplied with most switchboards, or by the nice adjustment of stop-cocks. Once installed it requires very little attention, will maintain a given pressure, and be always ready for use.

A tank of suitable size to receive the compressed air should be connected to this pump. Do not make the mistake of having too small a tank. I use a second-hand forty-gallon hot-water tank and have never found it too large. With a suitable "beer pump" you may have air

at the same number of pounds' pressure as the water supply, or, with specially made pumps, a double and quadruple pressure may be attained. A suitable pump may be purchased for from twenty-five to thirty-five dollars. My own water bills do not exceed three dollars per quarter for both house and office. The operating of the pump is consequently not an expensive item. The tank containing the air should be connected to the office by suitable pipes. I have the pump and tank in the cellar, and the connections are iron pipes $\frac{3}{4}$ in. in diameter; this has so far proved satisfactory, but a still better connection is made with $\frac{1}{4}$ in. lead or block-tin pipe. The advantage of the lead or tin is that fewer joints are required, each of which can be soldered. After the pipes are installed, have the plumber test them by means of soap-suds placed over each joint; if there be any leaks they will show themselves by the bubbling of the soapsuds. The pipes may be carried to any convenient point, and with the necessary terminals the apparatus will be ready for use.

The uses of compressed air in operative dentistry are many and varied. The application of medicines and antiseptic solutions is made by means of spray bottles with hard-rubber connections. In these spray bottles I use hydrogen dioxide solution, adrenalin, sodium chlorid, and other antiseptic washes. All of these solutions are first heated, and they require more heat than when used without the air-pressure, as the solution must be warm enough to heat the air as it passes through it. A temperature of 150° F. to 212° F. will be found necessary. The temperature will be modified by the openings of the air-spray, whether or not you accept them as supplied by the manufacturers, or enlarge them for special needs. The pressure used will also modify the temperature, the higher the pressure the more heat being necessary. The use of the electric spray-bottle heater, supplied by several manufacturers, will be found most satisfactory. I use the spray bottles in the treatment of dento-alveolar abscess, in the treatment of pyorrhea alveolaris, and also to distend the pockets

around teeth for the purpose of examination and removal of the deposits. The spray reaches every part of the pockets. A solution of salt is used to spray the oral cavity before taking an impression; an antiseptic wash is used to spray all cavities while operating, entirely replacing the use of the water bulb in my practice. The antiseptic wash is delivered with considerable force, and as the cleansing agent has all the desirable properties of air and water. The antiseptic wash is also used for spraying the field of operation prior to the injection of cocain solutions. The air is used to blow away blood and mucus while preparing a root for crowning.

In connection with the electric syringe the heated air is of great value; root-canals can by this means be located with the greatest ease, as the openings will be of a darker shade than the surrounding tooth-substance after the latter is thoroughly dried with hot air.

A novel use of compressed air is the cooling of gold fillings during the operation of finishing with sand-paper disks. The assistant directs the current of air on the filling, and perfect comfort is thereby assured to the patient.

One of my *confrères* has applied compressed air to a novel use. On the window-ledge above his chair he has placed a spray bottle, or atomizer, filled with cologne water, which is connected to the pipe by means of a rubber tube. Before a new patient is seated, or at any time when it is found desirable, he applies the air-pressure for a moment, and soon the atmosphere of the room will be permeated with a pleasant odor.

In the laboratory it is used in connection with the blowpipe for soldering or brazing. It causes a very steady flame—an ideal one for soldering—but until one is familiar with its use the work can be more easily burned.

I also use the air-pressure in operating the Jenkins furnace, and find it very satisfactory. I would rather give up my electric engine than the compressed air, and would advise every man who is seeking greater comfort and efficiency in his work, to avail himself of the advantages of a compressed-air outfit.

THE EDUCATIONAL INFLUENCE OF THE SO-CALLED "DENTAL MEETING," APART FROM ITS PROFESSIONAL OR SOCIAL VALUE.

By CHARLES McMANUS, D.D.S., Hartford, Conn.

(Read before the Seventh and Eighth District (N. Y.) Dental Societies, at the union meeting held at Buffalo, N. Y., October 30, 1906.)

IN the few moments at my disposal it is hardly necessary for me to dwell upon the professional value of the "dental meeting." For many years it has been the chief educational force in our profession. Before the publication of any journal, or the founding of any college, arose the desire for a dental society. Many years before the organization of our first national dental association, Hayden had the project in his mind, but the reputable dentists were few in number, and it was difficult to awaken a proper interest in the subject. It is to the credit of New York state that the first organizations were founded within her borders.

The dental society established, it was necessary that some means be afforded by which what had been said before a few might be presented to a larger audience. This the dental magazine was able to do through its printed pages, and for nearly seventy years it has been a potent educator not only of what we are pleased to call "the profession," but of the thousands of dentists all over the land. For all these years our periodicals have been, on the whole, a great credit to us, and have reflected very clearly the conditions of the profession. Like nearly everything else in dentistry—as in life—they have not been perfect, but they have represented the labor of some of our brightest and best men as editors and contributors. In the light of recent efforts toward what is termed "independent dental journalism," it is amusing to recall that the conductors of the *first dental journal* were quite willing to resign the

publication into the hands of the *first national association*, but that body declined the offer* at that time. The bound volumes of our magazines, consisting largely, as they do, of society papers and discussions, contain the literature of modern dentistry.

How many trivial papers when read before a body of dentists have been given a certain value by the discussion of the subject presented! Most of our leading men, including the professors and lecturers in our colleges, have "won their spurs" on the floors of our conventions, and the "germ" of many text-books is to be found in the transactions of some of our societies. So that one might say that the real entrance of the young dentist into his profession is not upon his graduation from a college, but upon the presentation of his first contribution, essay, or clinic before a body of his fellow workers.

It has been well said that the dental meeting is a postgraduate school, and in the past how many of our most valued practitioners could claim their dental society as their only alma mater!

But, if the *professional* value of the dental meeting is self-evident, the *social* value is quite as much so. Man is a social animal, notwithstanding the occasional exceptions, which only serve to prove the rule. One of the chief desires of the first national dental society was "the cultivation of the social virtues and their legitimate pleasures," and the con-

* *Amer. Journal of Dental Science*, vol. i, p. 194.

stitution of our present national association states that one of its principal objects is to "promote social intercourse and good feeling."

I sometimes think that in our appreciation of scientific and technical attainments we are liable to forget that they are not all that is demanded of the members of a profession. The dentist has been called a "narrow" individual, and I am free to say, after some of my experiences lately, that a few dentists are as narrow as the cutting edge of a razor as honed by Dr. Kirk. What makes them narrow? Lack of preliminary education, as I heard stated a few days ago? No, aside from the few that were born so, and are nearly hopeless, it is the lack of the social instinct that is the sad want. Let me quote a remark that I made, at an alumni dinner, ten years ago (and let me say that a paper might be written on the inestimable value of the dinner-party in dentistry):

"There are too many excellent men buried down deep in their own practice, doing an immense amount of good to their own patients—men of brains and skill—who, although successfully practicing dentistry, are not doing one solitary thing for the dental profession." To use a phrase of Edgar Poe's: "In this infinite universe they have no thoughts but for the teeth"—and themselves. They are the narrow men—graduates of our best colleges, subscribers to our excellent journals; so busy that they cannot attend meetings—that need broadening.

The only hope for them lies in the possible influence of the society, but as in many instances they are mature, in age at least, they will probably have to "gang their ain gait" to the end of the chapter.

But with the younger men the case is different, and the responsibility of the dental society greater. The future of the profession depends upon the influence of the society upon them. Is it too much to ask the ambitious young dentist who has deliberately chosen professional dentistry as his life-work to give back something to the calling that gives him all he has in life? He has not paid the debt

when he has his receipts for his tuition and his diploma, when he has purchased the necessary text-books, and subscribed to a few journals. He owes a real—not sentimental—debt to the men of the past who by their brains and by their willingness to sacrifice time and money, and in one or two instances their lives, have made it possible for him to follow a highly respectable calling, and have made his daily work at the chair and in the laboratory vastly easier for him and for his patients. He can hope to pay that debt in only one way: by carrying on their work in the manner they carried it on; by giving to his profession the best that he has to give. And he must do this, as they did, through the dental society.

But I have hinted at another influence of society meetings neither distinctly dental or particularly social, and yet which might do much toward broadening and cultivating our members. I refer to the duty of *merely attending* the yearly gatherings of the National Association. If ten years ago a dentist, let us say in a small town, had resolved to sacrifice a week's vacation each year to our National Association, and had followed it around the country, as a few of the faithful have, he would have been compelled to visit the cities of Saratoga, Niagara Falls, and Buffalo, N. Y.; Omaha, Neb.; Old Point Comfort, Va.; Milwaukee, Wis.; Asheville, N. C.; St. Louis, Mo.; and Atlanta, Ga.

There is an educational value in merely traveling—moving about this big country of ours, seeing its great railroads, its busy cities, its picturesque fashionable resorts, and as an antidote the wonders of nature. If the National Association has done nothing else than compel many dentists to visit Niagara it has served a purpose. What dentist attended the congress at St. Louis, with its representatives from all over the world, without carrying away a better appreciation of the dignity of his calling? What northern man attended the meeting this year at Atlanta, Ga., without getting a broader idea of the conditions in the South?

At these meetings one is necessarily brought into contact with the big men of one's own profession. It is an inspiration to see these men whose names are written large on the rolls of dental progress. How much more interesting it is to read a paper after you have some acquaintance with the man who wrote it. As one goes about the country one is privileged to see the offices and laboratories of one's fellow craftsmen, and this is often of immense practical value to us.

The chance of inspecting the various dental colleges over our land should not be neglected, particularly by our dental examiners. Most of the colleges are doing honest work for the uplifting of the young students, and it seems to me that many of the men who harshly criticize their management without knowing

anything particularly about it act upon the rule of "In lack of facts, believe the worst."

And so I have tried briefly to indicate a few of the many advantages of our meetings—not only professional and social, but I feel that, in the case of meetings to attend which causes men to travel a distance from their homes, they have a geographical and sociological value as well; and I make this plea to the younger men—that they frequent the meetings of the societies, and whenever at all possible, that they feel it a duty to attend the meetings of the National Association; for by so doing they will not only become broader-minded professional gentlemen, but, what is even more necessary, by getting better acquainted with the different parts of their country, they cannot help becoming better citizens of our republic.

THE EARLY DIAGNOSIS OF CANCER.

By MARSHALL CLINTON, M.D., Buffalo, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, held at Buffalo, N. Y., October 30, 1906.)

SINCE earliest ages science has been striving to discover new methods of prolonging human life, to preserve and restore health, and to find satisfactory methods of combating disease. The past half-century has seen greater discoveries and announcements of advance in scientific medicine than were ever achieved in a similar period of time. The great medical epochs of anesthesia and bacteriology and cellular pathology gave a more humane and rational view of disease processes. Thanks to the former, the sufferer is now able to peacefully part with many portions of his diseased anatomy, and by the help of the latter we are able to tell him—or, better, ourselves—much that was obscured by vague speculation.

Each year shows a slowly increasing knowledge of half-understood phenom-

ena, and gradually, little by little, we seem to be tearing down obstacles that have hindered our perfect understanding of the life of even the individual cell. No one problem presents more complex phenomena than the study of cancer. A short time since, the writer heard the despairing cry of a prominent worker on the cancer problem from a distant city: "Gentlemen, I wouldn't spend ten more years of my life investigating the cancer problem for ten thousand a year! Nothing on earth would tempt me! You are up against a stone wall when you try to solve the cause of cancer on any basis except that of pure speculation!" Fortunately pessimism and science are not boon companions, and where pessimism stays the hand of one, other gleaners in the same field of science toil on to the garnering of the harvest. Such work

as has been and is being done by the men in our state laboratory here is helping tremendously in the solution of the cancer problem. The evidence, although not yet the proof, that cancer is an infectious disease is more and more strongly brought forth by the accumulated data of our scientific investigators. When we find cancer cured by an antitoxin, immunity created by the same agent, and immunity destroyed by debilitating agents, the irresistible logic of our comparative methods proves the infectiousness of this malady.

You are all familiar with the general class of tumors known under the generic term "cancer," also with the different kinds of infection of tissues leading to the formation of tumors, each of which is designated by a term expressive of its anatomical characteristics.

So far, we know from our study of cancer that its growth produces the same irritation in tissue as is caused by the growth of bacteria. There seems to be a growth of an infected cell which by multiplying causes the familiar tumor masses. We know at present that no one of over thirty years is immune from this infection. We know that cancer may and commonly does arise at any point which is the seat of continuous irritation. It is common knowledge that cancer suddenly springs forth from the site of some old, long-standing slight and harmless growth. Nowhere in the body is cancer more apt to infect the so-called benign or harmless tumor than in the mouth or on the face. Fully two-thirds of all tumors met with are cancers, and a large proportion of these are grafted on a benign growth or scar.

The early recognition of cancer is one of the most complicated problems that the dental profession has to face. The most experienced clinician cannot tell when a benign tumor begins to undergo cancerous infection, or, when that degeneration does occur, where the limits of the disease may be. The early stages of cancer development may be likened to the quiescent period of an asparagus bed. Everything is quiet, no growth is visible, yet digging with the spade may bring to light its beginnings. Sud-

denly the growth springs up to notice, in the one instance developing into a beautiful many-branched feathery bush, and in the other into ulceration and tumor formation all around the original site, and dropping seeds like the seeds from the asparagus spray, in the all too fertile surrounding soil. To eradicate cancer, to cure the patient beyond possibility of recurrence, demands first, that benign tumors, little scabbing surfaces, little fissures, and tags of tissue on the tongue or mouth must be viewed with the greatest suspicion. To the slight importance given by the possessor to one of these little growths is due the frequency of the surgeon's meeting cancer of the lip or mouth only after it has developed beyond the hope of permanent cure. Many people die annually from cancer who could have been spared to further years of useful life had they been taught the tremendous importance of conservative treatment of any morbid growth in the mouth or on the face. By "conservative treatment" I do not mean any temporizing with the growth by local applications, etc., but that method that tends best of all to conserve the health of the patient, viz, to remove completely all diseased tissue as soon as it is discovered. Do not treat lightly any morbid growth in the mouth. Many patients will feel contented to wait until something further develops, but while they wait cancer insidiously develops, and, in tissues where its growth is rapid, they are forced to pay for their waiting with their lives.

So far, science has not shown us how to detect the epithelial proliferation, or beginning cancer, otherwise than by inspection. There is no application that we can use upon a suspicious point that will give any reaction suggestive of the presence of cancer. There are, however, three things we may and should do: First, in any patient who reaches the cancer age, remove any point of continuous irritation. Second, remove any so-called benign or harmless growth as early as possible. Third, advise the use of some non-irritating mouth-wash daily, such as a very weak iodine solution, on the principle that we are engaged in preventing an infection.

NON-UNION OF DOUBLE FRACTURE OF THE MANDIBLE SUCCESSFULLY TREATED AFTER A LAPSE OF TWO MONTHS.

By ALEXANDER HALL, D.D.S., Hornell, N. Y.

(Read at the union meeting of the Seventh and Eighth District (N. Y.) Dental Societies, held at Buffalo, N. Y., October 30, 1906.)

ON May 24, 1906, Mrs. H., age sixty-eight years, living in a small town in Canada, was thrown from a carriage, sustaining a bilateral fracture of the mandible in the region of the second molar.

Although she was under the care of a regular physician from the first, she did not recover the use of her jaw, and suffered severe pain nearly all of the time. Toward the end of July she consulted me, and I at once reached the conclusion that her case was an unusually serious one. The patient could scarcely close her mouth, and the chin hung down, thus giving her a decidedly unattractive appearance. Closer examination revealed a markedly senile maxilla, with a very good cartilaginous joint instead of bony union, allowing the chin to be moved up and down with the hand while the ramus remained stationary. She could not talk plainly, and to masticate food of any kind was out of the question.

Although at the time of the accident the patient wore very good fitting and well-articulated upper and lower dentures—which would have made an excellent splint had they been put in position after the fracture had been reduced and held in by a good outer splint and bandage—her physician had her remove the lower plate, and applied a tight bandage without any splint, thus causing the fractured ends to overlap each other, causing unbearable pain, and very naturally shortening the maxilla; all of which could have been avoided by using the material at hand.

I at once consulted several physicians

and dentists, and have to thank Drs. Rishel and Koyle, as well as those who helped to perform the operation, for many good suggestions.

On August 8th, with the assistance of Drs. Parkhill, Brasted, and Kysor, I operated in the following manner:

Morphin $\frac{1}{2}$ gr. and strychnin $\frac{1}{16}$ gr. was administered, and as a local anesthetic a one per cent. solution of cocain in distilled water was injected.

Dr. Parkhill made an incision in the gum and laid bare the ends of the bone; then, with a good sharp circular saw and surgical burs in the engine, I soon removed the provisional callus and enough bone to freshen the fragments, being careful to cut the ends of the fragments at the proper angle, so that when the parts were brought into apposition the fractured ends came perfectly together. This having been accomplished, Dr. Parkhill sewed up the wounds very carefully, so that no loose ends of gum tissue might find their way between the bones and cause a failure.

We next adjusted a vulcanite interdental splint which I had previously prepared, similar to the one suggested by Dr. James E. Garretson, and applied a plaster-of-Paris splint to the jaw, together with a bandage which, by being placed under the chin and over the top of the head, caused pressure in an upward and forward direction. Any backward pressure from the symphysis would have had a bad effect.

Although the operation occupied two hours or more, the patient made no complaint whatever, suffered absolutely no pain, and walked up-stairs at its com-

pletion. She remained quite still for two or three days, feeling weak and sore, but before the first week had passed she was going about the house and taking liquid nourishment quite freely. After the first week she suffered no pain and felt more comfortable than since the accident.

We loosened the bandage once a week, and while she held the outer splint carefully in her hands, I removed the interdental splint and cleansed it thoroughly, so that when the splint was finally removed, the mouth (with the exception of a slight abrasion caused by the splint) was not sore at all, the wounds seeming to have united by first intention.

As a dressing, solutions of hydrogen dioxid and Pasteurine were used, and to encourage the growth of the bone, the syrup of the hypophosphites was prescribed.

In four weeks the splints were removed, when both sides of the jaw were found to be perfectly united, and she returned to her home in excellent health. According to recent reports the jaw is in excellent condition, and very soon she will be able to wear a lower plate, which I advised her not to use until the consolidation was sufficiently strong for the jaw to withstand the stress of mastication.

CORRESPONDENCE.

THE MATRIX AS AN AID IN CAVITY PREPARATION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I notice in the issue for December 1906 of your invaluable journal that Dr. W. Leon Ellerbeck, in the course of a paper read by him before Section I of the National Dental Association, is reported to have spoken as follows:

"I frequently do that which I have not seen advocated, but which I believe to be at times good practice, *i.e.* applying the matrix in preparing approximal cavities in bicuspid and molars where we desire a square base, and where there are frequent opportunities, unless we proceed slowly, of cutting unevenly, perhaps wounding the gum, and perhaps damaging an approximating filling or roughening the surface of an approximating tooth."

I took no notice of this at the time of reading it, as I had no doubt that the erroneous impression which seemed to exist that the suggestion could be considered original would be corrected during the subsequent discussion.

My assumption, however, would seem

to have been incorrect, since I find from your May issue (page 494) that in the discussion Dr. W. Crenshaw, who alone referred to this point, seems to be of the same opinion as the author of the paper; for he says, "The suggestion of the use of the matrix in guarding against the cutting of the gum is a new idea, and I think a valuable one in the preparation of the gingival surfaces of molars and bicuspid, or at the cervical border of the cavity."

Under these circumstances, and with the idea of setting these gentlemen right, allow me to reproduce what I wrote in an article which appeared in the *British Journal of Dental Science* for July 15, 1905, entitled "Some Cases from My Note-books":

"In difficult cavities, if a matrix has been carefully fitted (personally I prefer to do this on a model) and wedged up between the teeth, it is possible to complete the preparation of the cervical edge in a most thorough manner, and without the slightest chance of the instru-

ment slipping and causing bleeding of the gum."

I must not be misunderstood as myself claiming originality for the idea, since I feel certain that long before the publication of my own paper it must have occurred to and been adopted by many other dental practitioners.

I would embrace this opportunity of expressing agreement with the remarks contained in your excellent editorial entitled "A Question of Journalistic

Ethics," which appeared in your January issue. The pleasant recollections I have of the courtesy and kindness extended to me during my visit to your country in 1886 by the late Dr. J. P. Grout and Dr. Sheffield, among others, made me greatly regret the necessity arising of your having to refer to such a matter as that which called forth your editorial.

Yours faithfully,

WM. M. GABRIEL, M.R.C.S., L.D.S.
LONDON, ENG., May 24, 1907.

PROCEEDINGS OF SOCIETIES.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-eighth Annual Union Convention.

THE thirty-eighth annual union meeting of the Seventh and Eighth District Dental Societies of the State of New York was held in the amphitheater of the Dental Department of the University of Buffalo, Buffalo, New York, October 30 and 31, 1906.

The meeting was called to order at 11 o'clock Tuesday morning, October 30th, by Dr. L. W. Robinson, president of the Eighth District Society.

The reading of the minutes of the previous meeting was dispensed with owing to the absence of the secretary.

President Dr. L. W. ROBINSON then read his annual address, in which he gave a cordial greeting to all members and visitors present, calling attention to the necessity for zeal and earnestness, together with conscientiousness in dental practice, not only for the material rewards that such effort brings, but for the larger end of developing a high professional character. He urged upon this audience the necessity for activity in all

lines of professional endeavor, to the end that greater progress might result; and closed by hoping that the social features of the meeting would be promoted by the efforts of all individually.

Upon motion the address was accepted and referred to the secretary.

As the next order of business Dr. Eschelmann presented the Business Committee's report, consisting of the printed program of the meeting.

A paper was then read by Dr. W. S. ROSE, Schenectady, N. Y., on "Co-operation in Dentistry," an abstract of which follows:

CO-OPERATION IN DENTISTRY.

There is no word in any language whose import during recent decades has meant so much, not only to these United States, but to the entire civilized world, as the single word—co-operation. To those who have availed themselves of its

operations it has worked hope, sunshine, achievement; for those who have rejected its advances it has spelled fear, discouragement, defeat—benediction for its votary, malediction for its victim.

Co-operation touches every phase of our national activities—from production to traffic and transportation—and has extended its influence even to the professions. It is responsible for our professional gatherings as dental clubs and district meetings, with some of their faults and most of their virtues. It has made it difficult for us to accept each other's hospitality and then to exaggerate or even accentuate the defects appearing in migratory dental work.

What advancement we have made from the privacy of the padlocked laboratory of yesterday to the publicity of the great clinic rooms of these conventions! I have here a materialized proof of the harmony existing among the members of the profession in one of our cities. The dentists of Schenectady are proud of their city dental club, and the more gladly is it referred to as being, at least in part, the product of the generous fraternalism taught and exemplified in our university here, and by our esteemed co-workers of the Seventh and Eighth Districts.

Bacteriology, anatomy, and mechanics, as taught in our colleges, have made of dentistry almost an exact science. Yet these are not the greatest product of our schools. The work effected in ethics and practice is in no sense inferior, and is the basic principle upon which all other advancement depends. Contrast the present with a few short years ago. Then the dentists of the same locality were cynical, jealous, censorious, critical, and even slanderous. Each refused to move along lines similar to those of his competitor across the way. If one were active in society work, the other emphatically was not; each endeavored to keep his clients strangers to or enemies of the other; both claimed pre-eminence in all branches of dentistry, which pretensions being necessarily false, the public sooner learned the defects and limitations of each. The spirit which had already sub-

divided the work of the carpenter or mason had not in dentistry given birth to the specialist. Dr. Smith considered it humiliating to have to send a case of irregularity of the dental arch to Dr. Jones for correction, or a difficult case of extraction to Dr. White; in fact, would not do so, preferring himself to render a patient inferior service. Now our profession, we are thankful to know, is outgrowing this narrowness. Imagine any broad-minded practitioner feeling humiliated in sending a case of epithelioma or of fracture to noted specialists in these departments of our work! He is elated at so doing. Yes—they can do such work better than he, because *he* can do something else better than they, and all deserve and can command better fees. This procedure is in line with the golden rule, and moreover is the very best business policy. In a small place the work cannot be specialized to such a degree, but it can be divided to an extent that would give to each practitioner supervision over that phase of the work in which he excels the all-around dentist. Enmity between the dentists of the same locality, be it ever so small, is inexcusable, and fast getting out of date. Permit me to offer a suggestion contributing to its entire elimination. If any here have an unsocial neighbor, try taking him into your confidence. Boldly ask his assistance. A jealous competitor, when consulted concerning a patient, begins to realize that you trust him, recognize his ability, and prize his aid. The next time a patient harshly criticizes you in his presence, he will not endeavor to pass upon you such unfriendly judgment.

So friendliness will grow, to mutual advantage. Each will soon learn to ignore any little slip in ethics that has been magnified in transition to him. True ethical magnanimity will win any fair-minded rival, and shame any obdurate one into passable silence. If there be one whom such treatment will not gain, it will at least accomplish his humiliation and defeat. He is surely playing a losing game. Much care, however, must be exercised in the practice of ex-

changing patients. If a brother practitioner entrusts one of his patients to us for treatment, remember it is the highest compliment he can offer. If we do not return him his patient more loyal to him than ever, we have betrayed a trust. In receiving another's patient it is our duty to render our best service exactly as requested, unless modified through consultation. If your neighbor dentist has discovered something you can do better than he, try to ascertain something that he can do better than you, and return his compliment by sending him a patient in return—thus proving your magnanimity and contributing your share to encourage specialization, and therefore greater efficiency of service.

The spirit of fellowship now so controls our districts that here are we today, really enjoying ourselves better as dentists with dentists than we could in an alien company, and sincerely combining to secure the greatest good to our organization and to the public we serve. The programs of our district meetings are largely modified by this modern principle. Formerly, essays were their chief and almost entire feature, but it gradually became evident that few papers contained anything of extraordinary merit. Occasional ones formed valuable contributions to our dental literature, but most were not of sufficient importance to escape the ultimate fate of the waste-basket. This operated to deter and discourage essayists, and many districts began to deteriorate, and were rescued from ultimate ruin only by two modifications in the programs—a new phase given to the essay and an abundant use of the clinic.

The first involved an abandonment by the rank and file of all pretensions to the extraordinary revelations of original matter, and a substitution therefor of an honest and unassuming contribution, involving an equal amount of labor, but covering soil already tilled. It is long since some of us attended college. New text-books and magazines contain information which we did not then get. What we want is the modest request that one of our number look up a subject, and give us a sketch, a review if you

please, of what we learned and may have forgotten, and of what has since been written. Suppose the subject is "The Therapeutic Treatment of Alveolar Abscesses." The essayist makes no pretensions of knowing as much or more of abscess than the others. His attainment has no bearing on the matter. It is merely his share of perhaps a disagreeable, perhaps a pleasant task, a looking up of one subject in return for others reviewing other subjects—merely a division of labor. By such reciprocity of effort we are kept up to date without getting insufferably conceited.

To this change is added a greater prominence to the discussions, which usually contain the real contributions. Here we learn of the little experiences, devices, the discoveries made by the toilers at the chair, which contribute to our store accidental yet often supremely valuable information.

Secondly came the assistance of the clinic used in much the same way as the revised essay, the clinician merely introducing a practical subject by clinic instead of by essay. He is not necessarily an expert in the trick he describes. The idea is more as if the executive committee assigned to some of the members a list of clinics, and each discharges his duty as well as he can by previous preparation.

Meetings are thus vastly improved, and essayists are rescued from the idea that great efforts are demanded or expected by censorious and exacting competitors. I believe that the Seventh and Eighth Districts are especially alive to the spirit of the times, yet I would urgently remind any who have been at all backward, from a modesty due to misapprehension, that if we wish to keep our districts toward the front, ability to do the exceptional is not expected not nearly so desirable, as the patience to collect and present that which is already known. Let us, then, strive not for the eccentricity of genius, but rather for the magic of industry and cheerful compliance; our district meetings will be a success in proportion, not as they give exhibitions of exceptional skill that appeal to

the few, but as they give the more common, yet tested and necessary, things that make all work more thorough.

Since the tendency to co-operate, to organize and regulate, has done so much for us, it should place us in a position hitherto unattainable for dealing with abuses that may have arisen in the profession, chief among which are the iniquitous devices and pernicious advertisements of the professional quack. True, he has long been ostracized as a degenerate, whose filling has fallen from a scientific achievement to an unprincipled pretext for filching his neighbor's purse. We have known him to be a traitor to his calling, and a betrayer of the trust imposed upon him. Being debarred from our dental meetings, his methods have so deteriorated that dental parlors are forced to thrive on dishonorable competition, advertising the products of their incompetence at a third or a quarter of the price they propose to extort. They promise impossibilities of excellence, and perform most inferior service. They use the style of advertisements long ago discarded by business firms, because odious comparisons and insinuating thrusts were found to be most antagonistic to the advantages accruing from the unionizing principles now employed.

If the creation of the dental bargain-counter were the only evil resulting from this style of doing business—I use the term advisedly—those who have already a lucrative practice might ignore the offence. But more reprehensible by far is the influence exerted in inducing the public to believe that they sufficiently understand their oral conditions to know exactly what dentistry they require, and consequently are prepared to order an extraction, an inlay, or a bridge, as one would a jar of butter or a dozen of eggs. Being ignorant of the research necessary to a scientific knowledge of orthodontia, oral surgery, or cavity preparation, and regarding even the skill in mechanics as unimportant compared with the material employed, there arises a most erroneous conception of the dignity and importance of our profession, a conception detrimen-

tal alike to its members, to the very highest in achievement, and to the public so designedly beguiled into those popular heresies that result in such general neglect and destruction of teeth.

Could we rise above all mercenary motives, and feel the sting that poisons a profession unsurpassed in efficiency or beneficence; could we realize how debasing is the commercializing influence of those who flaunt their pretensions in public prints and disgrace the fraternity whose reputation and fidelity protect them from the status of the common knave, it would seem that with the weapons of skill, intelligence, and co-operation at our command, we might, like some of our sister professions, reduce this evil to a minimum, and perhaps eliminate it entirely.

We should extend every consideration to those at the threshold of our profession, remembering that notwithstanding their efficiency in the text-book, the ethical development that comes only from years of experience is to them impossible. To a great degree it depends on us whether they shall be vessels of honor loyal to every elevating influence. If we give them the warm grasp of fellowship, gladly admit them to the inner sanctuary of our deepest professional interests, show them we have no limited cliques from which they may be excluded, and throw the mantle of charity over their inherent ethical frailties, then shall we avoid any responsibility for the degradation of the few who will, as a result of their innate and ineradicable depravity, sacrifice themselves to the fallacy that wealth is born of duplicity—if only advertised—and we shall save many from the "parlors" who will ultimately rise to positions of responsibility and renown.

Co-operation is a seedling that will thrive in any community, however small, but it is extremely susceptible to environment. It may be dwarfed by jealousy, blighted by self-interest, and destroyed by dissension; yet encouraged by care, consideration, and generosity, it will develop to proportions of beauty, symmetry, and strength. Let us go for-

ward with the resolve more invulnerable than ever to manifest the spirit of brotherly love, that real spirit of professional patriotism, which has been thus so beautifully and eternally enshrined:

This above all: To thine own self be true,
And it must follow, as the night the day,
Thou canst not then be false to any man.

Discussion.

Dr. F. W. Low, Buffalo. I have listened with very great pleasure to the paper, and the only thing I regret is that all the men who need to hear it are not here this morning. I wish it were possible for each member of our two societies to cancel his appointments for two days to attend these meetings and listen to every paper that is read. Those members who are not here this morning ought to be made to listen to this paper one by one. I cannot disagree with anything Dr. Rose has said.

Dr. L. MEISBURGER, Buffalo. I wish not only to compliment the essayist on the paper he has presented, but also on the very handsome collection of men he has shown us in his picture. I do not think there is any community in the state in which there is more fraternal feeling than among the dentists we have here in Buffalo. The fraternal feeling and the co-operative spirit among us here are, I think, of the best. I believe that co-operation in relation to the commodities of life is advantageous, but the co-operation which should exist among the members of our profession is a necessary adjunct for the man who would become a useful citizen in the community in which he lives and practices. The man who does not fraternize and mingle with his co-laborers is a man who necessarily falls into a rut, and is not capable of giving to his patients that type of service which is required of the scientific man.

There are many valuable points in the paper, which is very beautifully written.

Dr. Rose has given us a very high ideal, an ideal from which we can all learn a good lesson, and I think it would be of great benefit for many of the men

referred to by Dr. Low if they could hear this paper. It would prove not only to their advantage, but to the advantage of those with whom they come in contact.

Dr. ROSE (closing the discussion). It gives me great pleasure to acknowledge the compliments bestowed on the paper, which violates, "When you have nothing to say, say it." I did not present the paper as having anything of technical or scientific value, but the sentiments advanced are such as would do our profession good if they could be imparted to, and digested by, many of the profession who do not attend dental conventions. So far as you are concerned, there is little of value in the paper. It is practically a waste of time unless its thoughts are conveyed by you to others who ought to be here, but are not. I am glad you omitted the discussion of advertising, as a good deal of valuable time is often wasted in fruitless discussion of this objectionable practice. Still, I think that if we could more emphatically impress upon the public our opposition to such methods, much would be accomplished. In our city there are two advertising physicians out of nearly a hundred, practically no advertising lawyers, and six advertising dentists out of twenty-five. I realize it is next to impossible to entirely do away with this evil; yet it is unworthy of us to decide that because we have hitherto failed, the task is impossible. That is not the way past evils have been conquered. If we can at least reduce the number of sinners, it will be of benefit to the public and to ourselves. I do not wish to be misunderstood as to the idea of co-operation. I do not advocate that it should be of the character it assumes in the business world. There should be no restriction of effort, or attempt at equality of ability and remuneration. We should have something higher and better—we must stand brother to brother, and man to man.

I want to indorse what Dr. Meisburger has said about the Buffalo dentists. I think you have set the rest of the state an example in the matter of fraternalism. I believe you have here the

best standard to be found, and in our section of the state we have gathered much inspiration from the fraternalism which exists in these districts.

A paper was next read by Dr. ALEXANDER HALL, Hornell, N. Y., on "Non-union of Double Fracture of the Mandible Successfully Treated after a Lapse of Two Months."

[This paper is printed in full at page 728 of the present issue of the COSMOS.]

Discussion.

Dr. L. MEISBURGER, Buffalo. I want to say that this is a most interesting paper to me, possibly because it carries out the idea that I have had that the general practitioner—and I may go even farther than the essayist and include the surgeon—has no proper conception of the care and management of these cases. Within the past eighteen months I had a case of this kind. I was called to the hospital in consultation with one of the leading surgeons of the city, who had treated a case of fracture with no satisfactory results at all. The patient had suffered, besides the pain, the loss of two weeks' time from his business. I was unable at that time to take care of the case, but I was fortunate enough to have Dr. Waugh take charge. He was able to begin the treatment, and, with the aid of Dr. Tanner, carried it to a successful issue. I do not think that a physician should undertake the treatment of these cases. They belong to the dental surgeon alone; he is the man to treat them. I am glad indeed to have had the pleasure of listening to this paper, and want to thank the essayist for bringing the subject before us.

Dr. D. H. YOUNG, Attica. This is a subject to which the dentist ought to give more attention, because his familiarity with the structure of the parts, along with his ability to make splints for each particular case and the ease with which he can construct the needed appliances, makes him eminently fitted to deal with lesions of the jaws. When the dentist and physician appreciate each other's value, and work together in

these cases, the best results can be obtained.

The general public call the physician when these accidents occur. We are too young in our profession for our real worth to be generally known, but the physician usually knows, and those who are most advanced in their profession, I think, usually call in the dentist, or refer the case to him.

If we do our duty, the time is coming when the public will know the best source of help to look to in times of trouble of this nature.

The subject was passed, and a paper was read by Dr. CHARLES McMANUS, Hartford, Conn., on "The Educational Influence of the So-called 'Dental Meeting,' Apart from Its Professional or Social Value."

[This paper is printed in full at page 724 of the present issue of the COSMOS.]

Discussion.

Dr. J. Y. CRAWFORD, Nashville, Tenn. A very common preface to make in discussing a paper is to say that one is not prepared, but please credit me with being sincere when I say that I am surprised at being called upon to make some remarks upon this paper. I always feel embarrassed to follow Dr. McManus, because he writes such splendid things and says them in such a splendid manner. I listened to the paper with a great deal of interest, and trust to be excused for saying, in indorsing the value of the contribution, that we fail to receive benefit and instruction from papers because we do not fully appreciate the importance of the question at issue.

There are three principal factors in the growth and progress of the dental profession: One is the periodical and text-book literature of our profession; another, that to which he referred so earnestly in his essay, the work of our professional dental societies; and the third and principal factor in our progress and growth is the clinical study of the cases coming under our care. I come under the class of men to whom

he referred in his paper as looking to the dental society as the only alma mater they have. I came into the practice of dentistry when there were only four colleges teaching dentistry, and lived so far away from any of them that I was unable to attend college. I hired a preceptor, and gave him three hundred dollars for the privilege of studying in his office for fifteen months. When the fifteen months had expired I was not satisfied, and made arrangements to study for six months longer. At the end of that time my preceptor issued me a certificate of qualification for the practice of dentistry, and I went out to practice dental surgery. Practicing as best I could for a few years, I had the opportunity of taking a course in medicine, and of coming in contact with men teaching medicine and dentistry. During the time I was taking this course, one of the institutions to which I refer gratuitously and without my consent conferred upon me the honorary degree of Doctor of Dental Surgery. I hope you will excuse this personal reference, but I simply mention it to emphasize what I started to say—that I regard myself as under greater obligations to dental societies than to any one of the three influences to which I have referred.

The writer very beautifully suggested that the dental society should be, in force and in fact, a postgraduate school. It is the duty of every dental and medical organization in this country to offer opportunities as a postgraduate school, affording educational advantages better than those offered by any dental school. While I have been teaching for a long time, I want to say in this presence, in this hall in which Dr. Barrett—whose memory I honor today—used to teach and lecture, in this city where he lived so long, that the opportunities which are offered in our institutions of learning are not up to the standard that they should be. I say this with shamefacedness, not with any disposition to criticize, but in order to stimulate to better effort. There has been an exhibit made here this morning of the treatment of fractured jaws, and there has been brought out

in the discussion the manner of treating these fractures by the general surgeon. There is enough in that operation—there is enough reproof in that operation to stimulate dentistry to further activity, showing that in all colleges we do not impress the fundamental truths of the professions as the substrata upon which to build our professional educations. The worst criticism I can make of dental surgery is that few dental surgeons are primarily called to treat these fractures. And here, gentlemen, I would request every dental surgeon in the room who has been primarily called by the patient to treat a fracture of the lower jaw, to hold up his hand. [About ten or fifteen hands were raised.] I thank God for my trip to Buffalo. I have seen more hands raised to this proposition than I ever saw on a like occasion. I think Buffalo is doing better work than any city I have visited. In thirty-six years of practice, and having treated fifty-two cases of fracture, I have been called primarily by the patient to treat a fractured jaw but one time.

You have heard a great deal said on the subject of the education of the public by the profession; the training of the former by the reading of literature and text-books. I have never heard a man get up in public and suggest that you put in the text-books this inquiry: "When an individual comes to you with a fracture of the mandible, what would you do?" and the answer, "Call in a dental surgeon." Have you ever heard that, or seen that in print? We have heard many recommend the idea of putting in the common schools literature for children on this subject, and yet if any man here has ever heard that suggested, or seen it in print, and will send me his name, I will present him with a chromo. As to a general surgeon treating a fracture of the jaw—take an ordinary simple fracture—he cannot treat it properly, because he does not know how; but any dental surgeon in the country can do it. It is the duty of the dental surgeon to treat fractures as much as it is to extract teeth. We want to go back and convert the dental societies into post-

graduate schools, and I am glad to see Dr. McManus as a sort of peripatetic, migratory professor, going around and teaching the dental profession what we ought to do.

Dr. C. S. BUTLER, Buffalo. There are many most excellent thoughts in the paper, and the very best of them are not the ones to be discussed or emphasized in this presence, because those of you who are here are the men who do realize the value of dental societies, the presentation and discussion of papers, etc. The things most vital in the essay should appeal to those who are not here—those who do not feel the importance of dental gatherings, and the very great value that comes to a man in the way of ethical and social training in his mingling with men.

There are one or two points in the paper that I want to touch upon. First, it has something to say regarding dental education. Necessarily it must be so, considering the lines along which the paper is written, because dental education in some form, and dental development and acquirement of dental knowledge, are the fundamental ideas that underlie dentistry. I cannot quite agree with one expression of Dr. Crawford's relative to dental educational institutions. The wonder, it seems to me, is not that some of our schools are bad, but rather that all are as good as they are. We must never forget that dental education, dental science as a profession, is as young almost as the youngest man in this room, whereas all the other professions are centuries old. So I may say again that the wonder is that we have been able to make such marvelous progress along this line. Of course, however, we must not rest satisfied with what we have attained—we must go forward. The vitality of the profession is such that the progress already attained is but an indication of marvelous things for the future; but the development and acquisition of these things depend almost entirely upon those who are now coming into the profession and those in practice today, because our conduct, our methods, and our attitude, both moral and profes-

sional, toward our *confrères* will determine very largely the rapidity with which the profession advances.

There is very great impressiveness in the thought that the literature of our profession is bound up in the dental journals of the day. Have you ever thought of that? We have practically no literature outside of the dental journals. And as this is true, our dental journals become of very great value to us, and for the young man starting in the profession today, one of the first things that he should do is to determine he will acquire the dental journals as far back as possible for reference and study, because they constitute the literature of dentistry and must eventually become the classics of the dental profession.

Just a word in regard to the value of dental societies. It is hardly necessary to say anything to this audience on that subject, and yet I apprehend that few if any of us really appreciate their value as an educational factor and for the development of the social and artistic side of man. I have often thought of the great value to myself of our National Dental Association—to attend the meetings of which I have traveled over this country for the last thirteen or fourteen years—in meeting the prominent men of the country, as well as the benefits derived from a geographical study of the various states.

There is nothing on which a young man starting out in his profession today can more advantageously spend a little time and money than in attending the meetings of the National Dental Association. There he hears the best papers and discussions from the ablest men in the profession, and becomes acquainted with these men personally, and can thereby appreciate them, and obtain from them many things of value he might otherwise never be able to secure. Dr. McMANUS in closing the discussion expressed his thanks for the reception of the paper, and for the appreciative remarks of Drs. Crawford and Butler.

The next order of business was the reading of a paper by Dr. G. B.

MITCHELL, Buffalo, on "Alveolar Infection: Extraction *vs.* Retention."

[This paper is printed in full at page 708 of the present issue of the Cosmos.]

Discussion.

Dr. F. W. Low, Buffalo. (In opening the discussion Dr. Low read a brief extract from an editorial in the *Dental Digest* for September 1906 entitled "Is the Dental Profession Advancing from a Literary Point of View?") I think if there is anything that would refute the ideas advanced in that editorial by Dr. Crouse, it is this paper to which we have just listened. I was present in New York at a meeting of the First District Society two or three years ago, and listened to the paper by Dr. Robert Morris referred to in Dr. Mitchell's paper today, and I believe with Dr. Mitchell that Dr. Morris is right. In the first place, he has had a very large clinical experience with patients who seek the hospitals, where the services are free; these patients are of an ill-nourished, poorly fed class. Among this class of people there is in New York a greater percentage of pneumonia to the population than in any other place in the country, and I do not believe Dr. Morris made any mistake when he said that many cases came under his observation in which he found that the recent extraction of a tooth was the cause of the trouble. After the meeting I speak of we had a little luncheon, at which I met Dr. Morris, when he said, "Dr. Low, you seemed to be the only friend I had in the meeting tonight." This remark grew out of the fact that Drs. Rhein, Ottolengui, and many others had opposed the views of Dr. Morris. All these gentlemen criticized the latter very severely, and said that they never extracted a tooth until they had completely sterilized the mouth. Dr. Morris said he was pleased that I had asked them whether they boiled or baked their patients.

In my conversation with Dr. Morris I found that he had only been looking at one aspect of the question. The history

of all the cases I could get of that kind, where pneumonia had followed from alveolar trouble, and in which they had laid the blame on the pneumococcus, were cases in which there was an inflammation of the whole side of the face when the operation was performed. Frequently the mouth could not be opened, and instead of evacuating any pus or attempting to find out what the infection was, the operator simply prized the jaws apart, creating shock and mutilating the tissues badly. These operations are very frequently performed in the college infirmaries in New York, where no care is taken, and the patients are turned out like sheep, without any instruction as to post-extraction care at all, and these cases later drift into the college hospitals with pneumonia developing. Now what Dr. Morris proposes, I think, is rational treatment for these cases. No surgeon would take one of these ill-nourished, poorly organized persons into a hospital and perform any other operation until the patient had been cared for for a few days, and had been built up a little. They always have a few days' care before an operation. Now, Dr. Morris proposes that these cases in which the face is swollen should be kept under observation for three or four days, to determine whether there are pneumococci present; to administer an antiseptic mouth-wash, and build the patient up on a tonic for a few days. After determining with an aspirating needle that the pneumococci are diminishing or have disappeared, and that the phagocytes have come to the rescue, then extract the tooth. That does not take more than three or four days. And I think that in those cases where we find pneumococci present, there is no doubt that it is better to build the patient up and defer the operation, rather than to perform it at once.

The point made by Dr. Morris was that pneumonia of the jaw, with the barriers broken down, may travel to the lungs; just as, should we extirpate the parotid gland during an attack of mumps, the disease or infection might develop metastatic infection or mumps of the testicles.

Dr. H. B. HUYER, Buffalo. With all due respect to Dr. Low, I radically differ with him. This is a subject that has been very near and dear to me. About twelve or fourteen years ago Dr. Ottolengui approached this subject as the correspondent of the New York society. At that time there were a great many of the gentlemen who discussed the subject who recommended deferring the extraction until some treatment should be given, but at the present time practically every one of those men who took that stand recommend to extract the tooth, regardless of the conditions. In these cases where we see the face swelling in the course of three or four hours, we know what the trouble is, and it needs radical and quick treatment. We see the face getting larger and we know what the result is going to be; for we have noticed, in the course of a few hours after the filling of a pulp-canal, the face swell to such a size that we could hardly recognize the patient. This condition has also been noticed as occurring in a few hours after the first indication to the patient of any disturbance arising from any tooth in the mouth. This means altogether a different condition from the slow, gradually forming indurated edema often seen. It simply means a different form of infection, and brings about its characteristic systemic symptoms of chills, fever, and sweats in pronounced form—meaning, of course, septic absorption throughout the system; this, again, being characterized in its severity according to the kind of toxins derived from the infection. The systemic resistance is a very important factor all this time as regards the severity, the constipated, plethoric individual being much more vulnerable than one in perfect health. This condition is so rapid that nature does not have time to throw out her army of leucocytes and build up the pyophylactic membrane to wall off the area of trouble.

This original area of infection, unless immediate relief be given by depletion of blood and drainage, with the removal of as much of the septic area as possible, may cause the patient to pass through all

the successive stages of laparemia, septiceamia, and pyemia, with perhaps death in the course of a few days. When one sees a case of death from pyemia or septic cephalic thrombosis, as I have seen in these cases, it gives cause for thought and anxiety every time one of them presents. As above stated, our first object must be depletion of the infected area. The tooth-socket is a good drainage canal; the bowels are thoroughly opened, alcohol is used to combat the toxins, and such further radical treatment given as the case may demand. That is my procedure in this class of cases.

The only time I can conceive of there being danger to the patient by extraction in case of inflammation is when there is injury to the parts, the membrane being broken and the tissues mutilated, in this way affording entrance to the pneumococci or other infection. I believe in extracting these teeth in order to get rid of the inflammation there, but not to mutilate the tissues in doing so.

In regard to the after-treatment, I say frankly that where I have a case of removal of a tooth in which there is acute inflammation of the periodontal membrane only, I wash out the mouth and syringe around the tooth, but never put anything in the tooth-socket after the tooth is removed, unless some subsequent trouble occurs. In cases where there is a considerable amount of pus well circumscribed, this is carefully washed out and gotten rid of, and I do not put in hydrogen dioxid, or other strong antiseptics, but wash out thoroughly, using large amounts of water. Under ordinary manipulation one can get rid of the pus, and then use antiseptics, provided it be possible to remove them afterward with sterile water. If we use strong antiseptics, we simply irritate and break up the pyophylactic membrane, and afford opportunity for the extension of the infection to tissues not involved.

In closing, I wish to compliment Dr. Mitchell on the amount of work done in the preparation of the paper. One

other thought I wish to add, and that is, that we must always look out for women patients in extracting during the menstrual epoch.

Dr. MITCHELL (closing the discussion). I simply want to emphasize the point that so much is written along this line that it somewhat confuses the average practitioner. As I understand Dr. Morris, and others like him, it is dangerous to extract teeth before there is

an infiltration of the tissues around the teeth—that when we extract teeth before any pus or swelling has formed, and under suitable conditions, we offer the bacteria a seat for active proliferation, and bring about the source of trouble referred to. Before the infiltration takes place, there is a violent battle being waged. The correct diagnosis of this stage is a fine point.

(To be continued.)

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Twelfth Annual Union Meeting, Washington, D. C., June 7-9, 1906.

(Continued.)

Dr. JOSEPH W. WASSALL, Chicago, read a paper entitled "Extensive Gold Inlays and Their Application to Bridge Work."

[The paper is printed in full at page 690 of the present issue of the DENTAL COSMOS.]

Discussion.

Dr. B. HOLLY SMITH, Baltimore. The paper by Dr. Wassall is a confirmation of a practice of which I highly approve. I told Dr. Wassall that I have a large number of bridges supported by inlays only. Of course, I do not mean that those inlays are not locked. The method of putting a bar in a tooth as an abutment is absurd, because teeth have definite individual movements. I recommend this method of anchoring bridges, and look to its becoming a popular practice.

Dr. JOSEPH HEAD, Philadelphia. I have talked with Dr. Wassall over the subject of his paper, and we are absolutely agreed on the fundamental principles of the method in question. However, while he was showing those cases of crown work with bands projecting until they resemble mushrooms, I could not

help feeling that I myself may have been guilty of such errors. I think it is practically impossible to always fit a band under the gum, and so while the specimens of Dr. Wassall's accentuated the evil, they illustrate what every one of us is doing today. The fault lies not in the technique, but in the operation itself. When the band is fitted to a root out of the mouth the joint is bad enough, but when it is fitted in the mouth it is apt to be very much worse.

Dr. H. C. THOMPSON, Washington. I would like to ask the essayist to explain in closing the discussion how he consolidates the inner and outer shoulders. Does he get them in apposition?

Dr. C. J. GRIEVES, Baltimore. I congratulate any man who is applying conservative cast-filling methods to the retention of bridge work, and believe that the cemented filling scientifically made is the filling of the future. Dr. Wassall has given us something of great value. Personally I am inclined to follow Dr. Head's method of applying the cope in the cavity in the mouth for the purpose of accurate burnishing, particularly in large cast fillings. My experience in making compound cast fillings, particularly for canines and incisors, is that the

contraction of the casting, when made without partially filling and reburnishing it, prevents the seating of the filling without further cutting.

I cannot quite follow Dr. Wassall in his series of impressions and casts, and would like him to explain exactly what is the result of the uneven expansion and contraction of cast and impression. The impression is of "Perfection" modeling compound—I have always questioned that name a little as applied to modeling composition—and then the cast I understand is made of Ames' cement. Do you use it dry or wet?

Dr. WASSALL. Dry, as I explained in the paper.

Dr. GRIEVES. My idea was that without very decided expansion in either impression or cast or both, the filling could not be made to fit the cavity. There is to my mind a very decided objection to Dr. Head's remarks as to the inaccuracy of bands or root-plates fitted under the gum margins. It has been the practice for a long time among conservative crown and bridge men, as it has been among good operators, to tuck back these margins, when in the way, with a gutta-percha pack, or temporary crowns mounted with it. I do not believe that good men are plunging about in the dark, as Dr. Head pictures them doing, fitting bands the edges of which they cannot see; nor am I ready to part with the banded crown for a bridge attachment, in favor of the exclusive application of cast fillings.

Dr. E. A. BOGUE, New York. Our friend Dr. Wassall has presented a condition of things that has interested me. Many years ago a patient was brought to my office with a tooth split off very much like the one shown by the essayist, and I said to myself, "Do not most teeth which split in that way split on the buccal and not on the lingual sides?" I think they do, because the lingual cusp is not so high as the buccal cusp, and upon asking Dr. Head to show me his skull, lo and behold!—three labial faces are split off from the teeth in that skull. If Dr. Wassall can furnish us a method of supplying those buccal cusps in the

delicate fashion he has done here, I think I for one owe him my thanks. I look back to the time when I, too, like Dr. Head, made the caps down over the roots, and did not ever strike out beyond, but now I have learned a little better. When Dr. Head asks how to do that, I reply that he wants to use the Bütner crown apparatus. This apparatus is rather an expensive one. As it was not confided to the dental depots, it did not get abroad much. The Bütner crown had a central pin in the trephine, and the trephine went down into the root and around the root, and made the thing when finished absolutely strong, because of the strength of the caps and the central pin that was soldered to the mathematically adjusted circular cap of No. 28 gold plate. In that way a strong crown could be set, but it is not an easy thing to do. I do not know whether or not this apparatus can be procured now.

I owe my thanks to Dr. Wassall for another thing, viz, his recognition of the fact that a clean tooth never decays, and his working out a system by means of which a large proportion of a tooth which has been broken or decayed away may be restored, affording the possibility to the patient of cleaning it thoroughly.

Dr. M. F. FINLEY, Washington. I wish to congratulate our association on this occasion, and compliment Dr. Wassall for presenting such a paper as he has given us, showing a method by which the gum margin and the surrounding tissue is preserved from interference by the artificial substitute which is to restore the contour of the crown. It is one of the most beneficial features of any dental restoration to preserve that tissue from harm or injury during an operation. The consideration of this question of the occurrence of pyorrhea, which may originate from such a small injury, emphasizes the necessity of adopting the suggestions which Dr. Wassall has just presented to us. I, however, feel inclined to criticize the bridge attachment he has described, for the reason given by Dr. Bogue, viz, that the outer cusp of the tooth is unsupported in any way, and is weakened by the removal of the enamel

on the approximal surfaces. Frequently, even in the absence of a cavity, that outer cusp will split off. Why should we destroy the natural strength of the tooth and yet hope that it will remain intact?

Dr. G. E. HARDY, Baltimore. I have had some experience with the method described by the essayist, and I agree with him in believing that it has many advantages as a bridge abutment. Dr. Wassall has called special attention to the "shoulder" as prepared in the natural crown. With deference to his greater experience, I will say that I can see no advantage whatever in the shoulder, as it is more difficult to prepare a tooth with one than without it, and of course more troublesome to secure a perfect adaptation of the matrix. The shoulder is not needed as a "step" to withstand the force of mastication, as that is amply provided for on the grinding surface of the tooth. In setting a crown or "inlay" so made, there is great difficulty in placing it accurately in the cavity, especially if it be a bridge abutment. In such an event the inlay does not reach the shoulder, and a bad margin results. I think a better preparation is to bevel the tooth from the gum margin, and to prepare a groove cut mesio-distally through the grinding surface and extending nearly to the gum margin.

Dr. B. L. TAYLOR, Washington. Although I have been in practice but a short time, I have examined quite a number of banded crowns both of the shell and Richmond varieties, and I have yet to find one without some unevenness under the margin of the gum. In trimming down the bicuspid as the essayist does, to the extent required by the method, I think in a live tooth there is absolutely no danger of fracture, but the instruments used should be kept moist. The tooth must not be subjected to any undue degree of heat, otherwise death of the pulp is liable to occur. In cementing large inlays on live teeth I think it is advisable to coat the abutment with a varnish, in order thus to protect the pulp. In such cases I have used silver nitrate on the roots of the teeth and on the surfaces covered by a cap, so as to

diminish the liability of those tissues becoming the seat of caries. In pulpless teeth, I think there is great danger of fracture of the outside cusp, and I do not think Dr. Wassall would use this method on a pulpless tooth. I am satisfied he would use a pin.

There is a question I would like to ask Dr. Wassall, Dr. Head, or any of the members present, and that is in regard to the making of a bridge to supply a left central incisor, when the right central and left lateral incisors are perfectly sound.

Dr. H. P. COBBY, Washington. I listened with a great deal of interest to Dr. Wassall's paper, and agree with him fully in regard to the inlay principle and as to the use of platinum foil in order to secure a correct adaptation of the cope to the natural crown. I differ with the essayist on the method of preparing the natural crown, as thereby the enamel is left short, and consequently liable to fracture. If the crown is made to so closely approximate the gum tissue, I think it would be advisable to carry it below the gum tissue and to take off all of the enamel. A stronger shoulder can be had in the cementum or the dentin, tissues which are not so liable to fracture, and I do not believe it is any more difficult to obtain an impression of that part of the tooth. I do not use the impression method. I work directly in the mouth, as I find I can get better results in that way. As yet I have to find a material which will produce a model giving the sharp lines, corners, or margins of a cavity.

I heartily agree with Dr. Wassall in regard to the fitting of bands and to the bad effects resulting therefrom. I have realized the disadvantages of the band for some time, and this has stimulated me to devise the method that I have been using with some success, and which obviates the necessity of using a band around the root, or a metallic shell of a size larger than the circumference of the root or original contour.

Dr. WASSALL (closing the discussion). From the way my paper has been discussed, especially the point in regard to

the preparation of a shoulder at which the crown shall terminate, so that it shall be set into and flush with the surface of the tooth, I feel as if I was upheld in the stand I have taken. Dr. Holly Smith asked about the details of preparation. I think when you come to read the paper your curiosity on that point will be satisfied. Of course the preparation as shown here is diagrammatic. It does not mean that it is always done in the manner illustrated.

I have entirely abandoned the use of bands. Even when a band is fitted perfectly, it still must project. I do not use them for incisors or canines, any more than I do for molars or bicuspid, for by this means I eliminate every serious defect that the banding method has. I removed a crown the other day that I made myself about four years ago, and it was a creditable effort. I supposed the pulp had died from irritation due to a gradual decay, but when I removed the crown I found that caries had begun on the smooth surface below the band edge. Caries had developed even under the most favorable circumstances.

A MEMBER. That would be a good object lesson to suggest the carrying of the band below the gum.

Dr. WASSALL. It was below the gum. It escaped my observation until I removed the crown. Dr. Head's method of extending the cope into the pulp-chamber gives a degree of strength to the crown which fully compensates for the absence of a band. Very short dowels can be used in the canal, and this method, which can be utilized often, will be found to answer the purpose satisfactorily. For such cases I invariably take an impression, and have the cope made in the laboratory. The impression shows the margin at which the cope shall terminate, so that my laboratory assistant can turn back to me a very nicely made crown, and in this way my patients will be saved much time.

This brings me to the point on which Dr. Head and I differ, namely, the swaging of these matrices for inlays and crowns—on the tooth itself, or on a cast. That is merely a difference in method.

I think Dr. Head will change some day—be reformed and emancipated from much arduous toil.

Dr. Thompson asked a question with regard to securing contact and apposition between the matrix which is fitted first by pressing to the cast the thin platinum matrix— $1/1000$ of an inch—and the thicker platinum which is to be used for stiffening. The two are telescoped together, and thereby apposition is secured. Some space is required for the solder to flow in and stiffen them. The thicker one is made so that it fits loosely over the thinner platinum matrix, and in that way a very stiff cope is obtained. Dr. Grieves thought that it would be next to impossible to get good results by delegating this work to the laboratory. As a fact, however, I obtain in that way as good results as are obtainable by the method which he uses. In fact there is every reason, to my mind, to believe that more accurate results are obtained by having the work made in the laboratory on a perfect impression. Mechanics do not lie, and it is possible to get a perfect impression, a perfect cast from it. Of course you may ask whether I take into consideration the shrinkages of these different materials? I have to consider these theoretically, but practically they do not figure in it. Practically these different shrinkages are so infinitesimal that they do not amount to anything. I know perfectly well that when matrices or finished inlays or copes come back to me from the laboratory, they go into place snugly and tightly, and in every way satisfy my ideas of what I want and what is proper.

Dr. GRIEVES. Do not the models undergo a certain degree of shrinkage?

Dr. WASSALL. I concede that there may be perhaps both expansion and shrinkage, but they either compensate one another, or the alteration in volume is so insignificant as not to be of any moment.

It has been pointed out that there is some liability in all bicuspid to lose either the labial or buccal face. That is true. I can readily understand that where there is some liability to fracture

of a facing, this accident is more apt to occur in bicuspid bearing the crown which I have described; but that is after all a very rare accident. It does not happen, even in a large practice, once in three months. It is a rare thing, and an accident may happen to the strongest tooth. In the few cases where I have known it to happen the teeth had been weakened by large fillings.

Dr. Bogue spoke about the Bütner system of crowning, which does not require a band. The margin of the crown is flush with the surface of the tooth, as in the method suggested by Dr. Cobey. The Bütner method is imperfect because it is a machine method, and like the product of any other machine method of crown-making, it is not applicable to the six anterior teeth. It does not produce a margin that would suit Dr. Bogue's idea in actual practice. No machine-made crowns are possible in good dentistry.

Dr. Finley spoke about the risk of fracturing the outer cusp. I covered that point in the paper. Dr. Hardy spoke about the danger to the pulp. That point really needs no answer.

Dr. HARDY. I correct that statement. I did not mean altogether danger to the pulp. It is possible to prepare a tooth as suggested by Dr. Wassall without devitalizing the pulp, if you can induce a patient to stand the operation.

Dr. WASSALL. A tooth can be shaped as I have described it in all cases. I have never exposed a pulp in preparing teeth for those crowns. Dr. Hardy dis-

appointed me very much in decrying the work, because the "shoulder" is the main feature of my paper, as it does away with the band. The shoulder may be slightly exaggerated in the diagram, but this was done for illustrative purposes. In practice the shoulder is beveled a little. It is as easy to fit the cope as it is to fit a matrix to a cavity margin. Dr. Hardy also spoke of using large approximal inlays for bridge abutments. I can conceive of certain cases in which the inlay abutment may be useful, namely, in those in which the bridge is not subject to undue stress; but even then I would not rely on them. They have been tried. Dr. Brown's method you know—inserting into teeth bars supported by gold fillings. We have seen all those attachments fail, and the inlay method is not the better way of making them.

Dr. Taylor wanted to know what should be done in supplying a central. Where we have as abutments a sound central and a sound lateral, it is my invariable practice to apply this same method to laterals, canines, and centrals. The system is applicable to all the teeth. Dr. Cobey thinks that the enamel at the shoulder may chip away. The enamel is to be depended upon there as well as anywhere else. I have practically never had any trouble in that respect. Dr. Cobey does not follow the laboratory method of making the copes on a model of the tooth. I can only say that I could entirely satisfy all his mechanical ideals.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, March 1907.

A REGULAR meeting of the New York Odontological Society was held at the Academy of Medicine, No. 17 West Forty-third street, New York city, on Tuesday evening, March 19, 1907. The

meeting was called to order by the president, Dr. Turner.

The minutes of the previous meeting were read by the Secretary, and duly approved.

INCIDENTS OF OFFICE PRACTICE.

Dr. F. T. VAN WOERT exhibited a material sent to him by Dr. Jenkins of Dresden, by means of which it is possible to obtain the impression of a cavity and to prepare the die in a few moments. Upon such an impression a gold matrix can be most satisfactorily swaged with the aid of the rubber points devised by Dr. Van Woert.

Dr. J. H. REED. I venture to suggest a very humble subject, in the way of a slab for mixing cement. This is a matter I have been working on for the past two years, and the finished product which I have here tonight I have been using actively for three months, and I want you to see how smooth both sides of the slab appear. This has been used several times a day, and every time each side has been cleaned with a scrubbing-brush and "sapolio"—nothing else. It is a piece of glass of sufficient weight to remain immovable on the operating table while the cement is being mixed. On one side it has a "No. 2 emery" finish, on the other an "oil" finish, and on the edge a half-inch all around, the finish known as "No. 4 emery." The rays of an electric or gas light will not be reflected from the slab into the eyes of the operator. You can put a piece of ice upon one side of it, afterward throw it into boiling water, and then throw it into ice-water, without injuring it in the least. It has no corners whatever.

I brought a few tonight. It may be that some dealer will want to know of the manufacturer who stands ready to make these glasses at a cost not exceeding 50 or 60 cents each. I wanted to present it to the profession through the Odontological society.

Sometimes if the cement becomes very hard the slab can be cleaned with a little acid. No knife has ever been put on that slab.

The PRESIDENT. On which side do you mix the cement?

Dr. REED. I mix it on the rough side. The other side can be used for carrying medicine. I am at present working on a pair of little paddles with which to take

up the cement after it is mixed, in order to avoid the necessity of taking it up with the hands.

Dr. HILLYER. Will you make these paddles of glass?

Dr. REED. I do not know yet.

Dr. WM. B. DILLS. I have had trouble heretofore in mounting carborundum stones, and when Dr. Taggart read his paper in January, he spoke of cementing the stones into mandrels. I have found that when a stone mounted in that way is wet it will drop off in the mouth. I happened to think of DeTrey's low-fusing porcelain. You can fill the little cavity in the stone with the porcelain body, and when it fuses pass the mandrel into it. Dry it out over a Bunsen flame, having the mandrel in a pin-vise. By this means a stone can be mounted absolutely true, and will stand heat and moisture exceedingly well. You can throw it into ice-water while it is white hot without loosening it.

Dr. H. C. FERRIS. I might mention in regard to mounting stones that Spence's metal is also a very good material, as it adheres to steel. In a minute you can mount a stone and run it in the engine with the same satisfactory results.

The PRESIDENT. It gives us great pleasure to have with us this evening our essayist, Dr. J. EDWARD LINE of Rochester. Dr. Line has been one of the most active members of the New York State Dental Society, and we all admire him. He will read a paper entitled "The Aging of the Tissues, with Special Reference to Given Forms of Dental Abnormality and Disease."

THE AGING OF THE TISSUES, WITH SPECIAL REFERENCE TO GIVEN FORMS OF DENTAL ABNORMALITY AND DISEASE.

Things grow old, and it matters not, apparently, whether they be great or small, living or dead, organic or inorganic. And not alone in time, but rather in their power to render service, or perform what is, from certain stand-points, their allotted function. According to astronomers worlds have come and

gone, and even now some of those that are burning out are still in sight. They age in their entirety; they age also and most perceptibly in their parts. Not only the "everlasting hills" shift their places even as the sands of the dunes, but the very rocks on which they rest are crushed in the process of disintegration and decay.

In the strata of the earth we have pictured the beginning, the course and progress, and the ending of types—animal and vegetable—which in their day had a place in nature's economy—until either their own age or that of their environment made impossible the further exercise of their once-recognized special function. Their work done, their limit reached, they became a prey to later and better adapted types, or to conditions extraneous to those that made them and their descendants like clay in the hands of the potter; they were molded into other forms, and their material made useful to survivors that "fit."

This notion of the aging of things has a place in the thought and works of man in the building of machinery, in implements and appliances. We hear of the life of a locomotive; a trolley car; a stationary engine; a dynamo; a motor; of rails, axles, and wheels, and even of a crowbar. When a locomotive has done the mileage and the hauling fixed as its life-work by the designers and builders, it is braced up with renewals and repairs for a further effort; but sooner or later it is found in the yard engaged in switch duty. It has aged;—no longer capable of making an eventful run from Buffalo to Syracuse, it is made, while good for anything at all, to "sweep the walk and tend the baby."

Rails fresh from the mill have structure; axles too. This structure is fibrous, which means strength. These bend; with the aging of their material they approach the critical stage; this fibrous state through incessant pounding and ever-changing temperature yields to the crystalline; fracture is inevitable under the usual load, or because of increase of the force of impact, of even a lighter load. Car axles have been tied in hard

knots when cold, as in the Swedish exhibit at Chicago in 1893; an attempt at the same thing after a few years' service would result in fracture as sharp as that of glass. A crowbar is at once the simplest and most efficient of tools, but its efficiency as a lever depends upon the fibrous character of its structure. Give it age by long service, or by using it as a substitute for a bell—as in organ and orchestra chimes—and it becomes crystalline; when new and fibrous it bends, when old and crystalline it breaks. It becomes old as it crystallizes, whether that occur in a month or in ten years. Its age as a crowbar is according to its crystallization, and not according to the time it has stood in the corner. It is merely a question of exercising its function as a lever.

The same thing is true of peoples, of tribes, of families, and of individuals. Like the Dutch Republic, they have their "rise and fall," their coming and going, their beginning and their end. And their end is not necessarily as their years, but rather as the intensity of their living—not how long, but how much. The man from "up state," where the simple life is rounded out according to tradition, at threescore and ten, thinks he has the advantage of his metropolitan friend, who is old at forty-five; but he is made to think again when met with the reply, "Yes, you live longer in the country than we do 'on 'Change,' but do you live more?" Here again the problem resolves itself into one of intensity rather than of time. To revert to the locomotive, whose life for the work for which it was designed is placed at twenty-five years: If put under greater pressure and run at a higher speed it may be made to fulfill its mission, from the work-to-be-done standpoint, in fifteen. It has been subjected to the forcing process—it has aged; it goes to the scrap-heap with but ten years to its credit.

This is abnormal; and when abnormality is pushed beyond a given limit it becomes disease. The ox attached to a wagon or plough is exercising, from our standpoint, its normal function as a beast of burden—fatness now would be rated

as an abnormality; later, when stalled and fed for the slaughter, the putting on of fat rates as a normal function, and the exercise of the muscles, except as a mere supporting structure pending the addition of this tissue, is prevented. The function of the Strasburg goose is to develop liver, but the abnormal development of this organ incapacitates its owner for the proper performance of its duties as a goose. From the standpoint of the dealer in goose-livers, the bird is "doing itself proud"; from the standpoint of the normal goose in the near-by pen this indisposed neighbor is in an abnormal, possibly a diseased condition, and a condition purposely developed.

An organ and every tissue of that organ grows and develops at the expense of other organs and their respective tissues; as it augments in size through the intensified activity of its several tissues and cells, other organs and their respective tissues weaken—they become old before their time, and while they may recuperate under a return to former conditions, they may also have been restricted so long that a return is impossible—the impress is that of age and ultimately death.

With inanimate things, as steel rails and axles, there is no return to the original structure without recourse to high heat and further pressure of heavy rolls; but these rejuvenating or revivifying processes (so to speak) are from the outside—they are extraneous; the possibility of return does not inhere. With animate things, however, the conditions are otherwise—the possibility of self-return is inherent.

The individual, with every organ entering into its make-up, every tissue of which the organ is composed, carries with it—lugs along, from its earliest stages of growth and development—what is known as embryonic tissue, a thing actually or potentially capable of much mischief. This is similar, as a rule, to that by which it is surrounded, but which until late in life exercises no function; it is like a spore in the so-called resting stage. When tissue that has been active reaches its limit—when, because of long ser-

vice that has exhausted its vitality and all but worn it out, it assimilates, grows, develops, reproduces its kind with difficulty—this embryonic resting, sleeping tissue springs into activity, and there result abnormal growths that may and do terminate in disease.

Malignant growths are of this character. We have such of the tongue, which means an abnormal increase of cell elements, some of them normal to those of the tongue; or of the liver—an abnormal increase and activity of cell elements, some of them normal to the liver. These have been carried along like the traditional serpent in the lady's bosom; they spring into activity and in due time sting their host to death. No matter what one's theory, the fact remains, and the result is inevitable.

And this would seem to apply to certain of the abnormalities found in the dental organs. In its earliest stage we find the first suggestion of the pulp in the dentinal papilla,—a mere mass of cells; later, in the dentin bulb—a cluster of cells in which have developed a network of capillaries, to which are later added a similar network of nerves. Specialization goes on, and as a result we have dentin, normal in amount, in distribution, and in function; but sometime in the history of the tooth we have the development of dentin in the substance of the pulp; also deposits of calcific matter that bear no structural likeness to anything normal to the pulp. Up to this stage we have no evidence of their being, but because of the weakening, the working-out or wearing-out of the hitherto normally active elements, their presence becomes manifest. The "battle of the cells" is on, the further development of dentin, normal in kind, position, and relation, is at an end, and in its stead we have evidences of what has been termed "constructive degeneration," in the form of dentinal and calcific deposits, varying from the periphery in the center of the pulp. The normal elements of the dentin-forming organs are reduced to a struggle for existence; but their fate and that of the pulp itself is like unto the sturdy oak, at whose base the suckers

and saplings of its own breeding rob it of nutriment, to its downfall and death.

If we turn to the surface of normal cement, we find the cemental cells taking on an intensified activity that results in hypercementosis. They are youthful, vigorous, aggressive, and pile on layer after layer at the expense of the bone cells of the alveolar process, whose life-work is done, and whose powers of resistance are those of the army in retreat. Or the process is reversed—the bone cells thrive at the expense of the cemental, and by resorption the tooth is lost.

When we look at the pericemental membrane in that affection described as "recession of the gums," and from which we get no suggestion of disease, we note the weakening, the wearing out, the aging of the elements that build up the supporting tissue, and for a time fixed the tooth in its place. Their day is done; from the fixation standpoint they have ceased to function—this cessation being a normal process, and no more to be wondered at, contrary to our habit, than failure of the sense of touch or taste or smell; the opacity of the crystalline lens, or the shedding of one's hair.

In the case of abnormal changes in the pericementum that end in disease, the struggle of cell elements is further in evidence. The deposits may be serumal or salivary, or both, or neither; and while the cells take no active part in the destruction, they are exceedingly active in preventing its being done. They offer resistance at every stage of the process, but because of their weakened condition they give way, and in due time the tooth lets go.

If the teeth have not yet reached their prime (and prime varies with the individual), active interference mechanically or medicinally may tide them over what may be called an incident in their history; but if their prime has been passed, the removal of deposits, polishing of surfaces, massage of the soft tissues, their bombardment by means of electrical appliances, will serve merely to stimulate them to a further but eventually ineffective effort at retention. The cells and fibers have seen their best days; they are

weak, worn out, old, and like all things of which this can be said, while they may be stimulated into something like normal function by forms of manipulation that have for their object the fixation of the tooth, the final outcome is that of a thing fed by force.

Discussion.

Dr. R. H. HOFHEINZ. All living bodies exist by virtue of an inherent vital principle, through which they are enabled to appropriate for their growth and development the elements necessary for that purpose and also to multiply. Throughout the body the process of renovation is constantly going on. The entire body is a vast chemico-vital laboratory, constantly taking up new elements and forming new combinations, the while dissolving and eliminating old and effete particles.

What we observe in the growth of the hair and nails is but an example of what is going on in every part of the human system. The changes which the dental tissues undergo are of great interest. The odontoblasts and their prolongations in time produce that dentin which is irregular in structure and but scantily provided with dentinal fibers—the so-called secondary dentin.

The two most important questions with this aging of the pulp and its adjacent tissues, are—(1) What are the possible pathological symptoms? (2) At what time of life does this metamorphosis take place?

Where this aging of the pulp is progressing in a slow and normal way, there may be no response from this change, excepting an external physical one in the wearing down of tooth-structure. Where, however, this aging process is assisted by a traumatism of some kind, the teeth are apt to become extremely sensitive to changes of temperature. Some individuals are not troubled in the dental region, but suffer from neuralgia in various branches of the trifacial. This usually ceases when the pulp has reached its last stage of aging—that of calcification, or so-called ossification.

I also believe that the degree of sensitivity is somewhat dependent upon the location of this secondary formation. If it be in contact with primary dentin and with the lining of the pulp-chamber, pain may never manifest itself; but if it occur in the pulp tissue itself, pain almost invariably exists.

The aging of the peridental membrane is today the most vital question which presents itself to the dentist. We are not apprehensive when we find a large cavity in a tooth; porcelain or gold will fill it successfully for many years. But we all dread the patient who comes to us with a loose tooth, which condition usually means an aged pericementum. The once fibrous connective tissue is gradually changing to one of which the essayist says, "Its active cells are cemental, the weakened ones are those of the bone. Cement grows at the expense of bone." This aging of the pericementum, which almost invariably finds its expression in pyorrhea alveolaris, is the most unhappy dental change with which we have to deal.

The alveolar process and the pericementum are but transitory structures, and there is every reason to believe that the jaw itself is more or less transitory, growing smaller with years. Owing to their transitory nature, the alveolar processes and pericementum are unusually susceptible to the influence of irritation and the cruel march of age.

In a paper on "Pyorrhea," Dr. Frank H. Sibley said that it was largely due to arterio-sclerosis. This invariably comes with age, and is characterized by a thickening and hardening of the several coats of the vessels.

This aging of the tissues is manifested in the aging of nearly every individual cell. The essayist tells us that they look worn, that they are shriveled; the cell-substance is in abnormal excess of the nucleus, which in its turn is reduced to little or nothing. It is the same with age in general; the body looks worn, becomes shriveled; general substance—usually adipose—is in excess of the nucleus of the body, meaning the intellect—the brain power. Shakespeare says, "When

the age is in, the wit is out." Health represents the harmonious action of the vital force and the various functions of the organism. The more complex or delicate an organ is, as for instance the pulp or pericementum, the more liable is it to disorder and the effects of age.

Vegetable life may only suffer from a lack in the quantity and quality of the material which makes up its structure. In animal life we have an additional great factor to reckon with—the psychological one. Our will, our thoughts, our hopes, and our fears, are more or less reflected upon our very being. Hence the more refined, the more delicate and sensitive the organism becomes, the more exquisite are its perceptions and enjoyments, the keener its grief or depression, and the more liable is it to become ill-adjusted, to fall into disorder, and to age. It is for this reason that nervous derangements of any kind are apt to reflect upon the teeth and their adjacent tissues. Many pericemental disturbances are caused by neurasthenia, and if nature fails to restore the correct balance between its cells and the blood supply, early aging is the inevitable result.

Dr. JARVIE. This is a subject that I would not for one moment think of discussing unless I had previously had some little time to study it and prepare myself, for its presentation is somewhat different from what I have ever seen or heard. I gather from what Dr. Line has said that a man who has arrived at my age may live along by a little stimulation and a little prodding now and again, but that the end cannot be postponed very long. I think there is really something to be said in favor of his theory, particularly in regard to the tissues that hold the teeth in their sockets. I have sometimes thought, when I have had cases of pyorrhea and loosening of teeth come before me, and my best efforts have only been able to postpone the evil day, that possibly it was a part of nature's cycle that this pyorrheal condition should take place.

We know that although during early childhood the deciduous teeth are small

and few in number, they satisfactorily perform the function of masticating all the food necessary for proper nourishment during childhood; and then, as the child grows into youth, stronger and larger teeth are supplied. As manhood is attained, even more of them are supplied, so that eventually he possesses a masticatory apparatus that will properly prepare the increased amount of food necessary to nourish the fully matured body. Then as people grow older less food is required, and as they grow still older there is much less use for the teeth, and nature may have provided this means of getting rid of them, just as they are at first supplied according to the needs of man. Consequently I feel that the tissues that hold the teeth in the mouth may have a fixed period of life or activity, just as is the case with iron or steel, or any inanimate object, with this difference; that in the inanimate body, the length of life or usefulness is gaged entirely by the amount of use to which it is put; while in the individual, or the animate body, that is not the case.

As the essayist very properly said in his paper, should you put a crowbar in the corner and not use it, its strength and usefulness would remain forever; but use that crowbar, and you will find after a certain amount of use that crystallization has occurred, and its usefulness as a crowbar is at an end; the same argument would apply to the axle of the locomotive. Crystallization sets up, and by crystallization conditions are changed, and loss of usefulness results. But this period of usefulness or service in the crowbar and axle is governed entirely by the amount of use to which they are put, and not by their years of existence; whereas in an animate body, whether man or beast, the length of life and usefulness is governed very largely by years, although of course, as has been said, a man residing in Rochester with the quiet life led there may live longer in years than the one engaged in Wall street. The appearance of the essayist certainly bears out this hypothesis, for he does not appear any older tonight than when

I first knew him, at least thirty-five years ago.

Dr. V. H. JACKSON. The subject presented is a broader one than appears at first sight. It is known that certain metals, as the precious metals, do not deteriorate with age, while some of the base metals or combination metals do. That is why we sometimes find a specimen of spring German silver that has lost its springy quality and consequently breaks easily; therefore, in purchasing spring German silver it is necessary to ascertain that we are getting a newly combined or freshly drawn metal, which, however, should not be overdrawn.

There was a nice point brought out by the essayist regarding the tissues supporting the teeth in their sockets. We know the conditions existing in cases of pyorrhea. In the first place, in the treatment of this disturbance we have to consider the systemic aspect of the disease. If the tissues about the teeth are becoming unhealthy we may expect to find that the entire system is not up to par; but I am going to speak more especially of local irritations.

When there is a foreign substance in the eye it produces congestion; the bloodvessels become enlarged or swollen. If there be an irritant about the neck of the tooth, as a calcareous deposit, the tissues that are in contact with it become more or less inflamed. It might amount to a slight congestion, not reaching a definite degree of inflammation, or the contrary might be the case. When there is congestion, what is the condition of the alveolar process through which the vessels course? The bloodvessels become swollen or enlarged; the pressure on the vascular walls causes a softening and absorption of the process, and a gradual loosening of the teeth results. It should be borne in mind that the bloodvessels form a minute network in the alveolar process as well as in the peridental membrane, and in pyorrhea, absorption of the bony cells between the vessels occurs. Therefore if an irritant be allowed to remain, the vessels become so enlarged that they absorb the bone between the vascu-

lar walls, thus permitting the tooth to move in the socket.

I am a great believer in massage. First remove the irritant, and see that by proper manipulation and treatment we keep the tissues free from it permanently, and we will find that their recuperative power is great. Regarding irritation, we know that as we implant a tooth, even if we have enlarged the alveolus, the process will throw out osseous structure around the root, and that the soft tissues will contract around it. Where the cementum of the implanted tooth is injured or has been roughened through the forceps or through the polishing of the end of the root, the tissues in those areas will never become strictly healthy. Absorption of the root will begin at the points of injury in the cementum. I stated these facts some twelve or fifteen years ago before the National Dental Association, but I do not think that they are taken into consideration by those who are implanting teeth at the present time. The old theory was that if the periodontal membrane was left on the tooth it would stimulate the deposition of osseous tissue around the root. The periodontal membrane on the root and that in the socket does not become reunited. The point I want to make is that in cases of pyorrhea we should always be sure to remove any local irritant from about the root of the affected tooth.

Dr. REED. I thought the essayist was going to touch more upon the matter of the aging of tissues in connection with changes in facial expression, and that he would have dealt more in detail with regulating operations. I think Dr. Jackson is very modest not to have brought out some remarks regarding the latter subject. We should be very thankful that we are able at the present time to preserve the youthful features of the young people who come to us in need of orthodontia treatment, and who, if allowed to go on without proper treatment, would present an aged facial expression.

Through the great advance that has been made in the matter of regulating, and especially through what Dr. Jack-

son has done for the profession in that special line, we are able to do things today that seemed impossible twenty or twenty-five years ago.

Dr. J. H. HANNING. I think Dr. Line has done much more than he realizes in bringing to our notice the subject of the aging of tissues. If we consider the subject carefully, we will discover that aging occurs in what might be considered normal structure. Cells grow to their prime, and then they decline; and while we may call it abnormal, the process is really not so at all. It is just as the general process of life; just as a chemical solution. The essayist has done something else which is very valuable, and that is to make us see that we are not infallible. We cannot do a number of things that we think we can, and this should make us a little more modest.

I have listened to a considerable amount of discussion on pyorrhea alveolaris and scaling of teeth, and I think I have cured a number of cases of pyorrhea by scaling them and by removing abnormal deposits; but I realize that if the diseased tissues have no recuperative properties my work will be useless.

Dr. FERRIS. One point occurs to me that has not been touched upon in the discussion, and that is the premature aging of man through changes in blood pressure. What is the cause of the man becoming prematurely old who is living the rapid life "on 'Change"? If his tissues change rapidly, or a senile condition occurs earlier than usual, there must be a cause for it. Dr. Talbot has already touched on that point in several of his papers. It seems to me to apply very forcibly in our life and practice. The man who is under such a nervous strain, naturally has a lowered blood pressure, and his tissues fail to perform their normal functions. Consequently senility is hastened through lack of blood pressure from whatever cause, and we frequently find patients who are comparatively young appearing old both in action and in tissue changes. We find that men "on 'Change," and those who are constantly under a heavy nerve strain and lead over-active lives, are subject to

pyorrhea. Dr. Nelson T. Shields, in a recent paper, called attention to the frequency of pyorrhea among such patients.

Dr. LINE (closing the discussion). There are statements in the paper that might have been made more specific, but I well knew that by making them in more specific form I should simply get myself into trouble, and trouble is not what I am now looking for.

Everything has its life-cycle—disease germs not excepted. Some years since an up-state city had a biological examination made of its water supply. The source of this supply is a small lake, six to seven miles in length, and from one-half to three-quarters of a mile in breadth, twenty-eight to thirty miles to the south of the city, the water reaching the point of general distribution by a gravity line broken in two places by as many reservoirs. A resident engineer of national repute in the matter of water supply, water storage, sewage disposal, and kindred subjects, happened to be specially interested in biological matters at the time, and upon the occasion of an outbreak of a certain germ disease in the little village on the stream that enters the head of the lake in question, took upon himself the study, in a general way, of this particular germ, also the making of a calculation as to its life-cycle and its possibilities for mischief to a large percentage of approximately 150,000 people. He found that this germ completed its cycle in about six days; that by increasing the food supply and raising the temperature its life could be shortened to from three to four days; that by withholding the food supply and lowering the temperature its life could be prolonged to from eight to ten days.

He also found that chips dropped into the headwaters of the lake would reach the foot of it, or the vicinity of the intake, in about six days, and from this point quickly carried—barring its detention in the reservoirs—to the city system of house distribution. Two ways suggested themselves of handling a matter of this kind in the laboratory, and of course on a small scale, but none that would apply in the greater field, except possibly detention and destruction: Intensifying its vital activities—by means of food and more favorable temperature; or, depressing those activities by withholding the food supply and reducing the temperature, supplementing by detention. No consideration was taken of the germ's possibilities in the way of self-propagation, whether by fission or by spores, which in itself is an aging and self-destructive process.

From this standpoint every individual and every cell—dental or other—has its life-cycle. The question is, Shall it intensify its activities or have them intensified, and live itself up in one day, or may it stretch the period to two? Shall it live out its time normally as to quantity and quality, or shall that time be abnormally shortened?

To say more by way of illustration might lay me open to the charge of "rubbing it in"; there is valor in the exercise of discretion.

Dr. WM. B. DUNNING. I move a very hearty vote of thanks to Dr. Line for his interesting paper.

The motion was carried.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

AMERICAN DENTAL CLUB OF PARIS.

President—DR. W. S. DAVENPORT.

Abstract Report of Meetings held in 1905 and 1906.

(I.)

INCIDENTS OF OFFICE PRACTICE.

Dr. HORTZ related a peculiar case of absence of the permanent dentition. The patient, a young lady eighteen years of age, still retains the deciduous teeth and presents no sign of the permanent teeth having ever erupted. Her father, a physician, explained that the girl was born without hair or nails; today she has but a scant amount of hair and her nails are exceedingly thin.

Dr. WETZEL then exhibited casts of a case of open bite in a boy fourteen years of age, in order to hear the views of the members as to the best method of correcting the irregularity at the least possible expense to the patient. He thought that under the circumstances it might be advisable to devitalize the pulps in the lower molars, especially in the first molars, then to grind the teeth down and adjust gold caps on them, in order to render the upper teeth useful and restore the occlusion.

Dr. BURT suggested that a cap be made and supplied with strong bands at the sides so that they could be tied under the chin, and that the child be made to wear the appliance at night, as by this means he had succeeded in similar cases without touching the teeth.

Dr. YOUNGER considered Dr. Burt's suggestion an excellent one. He furthermore stated that the difficulty is in the upper jaw, and that the upper teeth could by that means be more easily driven up, and that when the bicuspid are properly regulated, if there still be a space between the incisors, these could be brought together with the aid of ligatures.

Dr. BRYAN, Basel, Switzerland, agreed with Dr. Burt's suggestion, in that the conditions in the case under consideration are simply the result of the jaws being unduly apart, and that under that treatment jaws would be forced back into position in a short time.

Dr. ANEMA thought that the trouble had been caused by adenoid growths which should first be removed. The regulating should be done according to the principles advocated by Angle, in order to bring about proper occlusion of the bicuspid and incisors.

Dr. WETZEL then presented an electric furnace provided with an appliance to take the place of the pyrometer. His invention consists of a platinum balance suspended from the back of the furnace muffle, one arm of which is weighted to counterbalance the other one, which holds a pellet of porcelain. When the pellet melts and drops off, the other arm descends, and coming in contact with a wire causes an electric bell to ring, thus announcing the fusing of the porcelain within the muffle.

The essayist of the evening, Dr. LYMAN CURTIS BRYAN, Basel, Switzerland, then read the following paper:

THOROUGHNESS IN DENTISTRY.

There are many things which go to make up thoroughness in dentistry—such as the making of perfect fillings, the thorough correction of irregularities of the teeth, the thorough extension of cavities for the prevention of decay, the thorough condensation of fillings, the careful finishing of the gingival margins of fillings, the thorough care of the teeth of children with the view to prevent ir-

regularities, loss from extraction, and consequent tipping and turning of the remaining teeth, and all the ills that follow the indiscriminate extraction of teeth in children, but it is not my province to touch on these different subjects in the limited time at our disposal. My object will be to call your attention to other matters which are not generally discussed before dental societies, and to see if I cannot bring something home to all of you which may help in your daily work, and stimulate you to do those little things which contribute so greatly to the comfort of the patient and render dental work more lasting. I think I could do nothing better than to confine my remarks to two points: (1) Thoroughness in cleansing the teeth, from cusps to alveolar margins, and (2) preventive dentistry, including those hundred and one little things which we all know so well should be done, but which, as a rule, we do not take the time for, saying to ourselves that the patient would not appreciate their value.

This attention to detail would mean considerable expense to the patient, but would reduce to a minimum his bills for the more painful operations of filling.

One who has never tried the methods of practice which I follow would be surprised to find the number who are glad to avail themselves of the benefits of thorough work in a practice among intelligent people of the present day. As Dr. Wright has said in one of his former papers on prophylaxis, the increase in refinement in all classes of society in the last score of years makes the thorough cleanliness of the mouth and beauty of the teeth and gums no more a luxury but a necessity, and a person with unclean teeth, red and inflamed gums from serumal calculi under them, and fetid breath from this and other dental causes, is not only shunned in refined society, but is looked on with disfavor by the middle classes.

Volumes could be written on this heading, but we are all familiar with the evil, and the question under discussion now is how to combat it. If every dentist would give to this subject the

thought which it deserves, and would devote more time to prophylactic treatment, the object would be achieved, and the human race would be the better for it. But I fear the profession is not ripe for it. This work is not attractive to the professional man. Some of us must look elsewhere for those who will undertake this all-important treatment, if it is to be done as it should be. Dr. D. D. Smith believes that only the conscientious dentist can do this work, but we have seen that the dentist will not, or cannot, for various reasons, give the necessary amount of time in order to do this work thoroughly.

I, however, prefer to give this "prophylactic treatment and general attention" myself, and if possible turn over much of the routine work, such as gold and porcelain fillings, to a skilled operator whom I know to be capable of doing it thoroughly and well. In some cases work should be referred to specialists, if one will give his time to do thorough work for a select and limited practice.

Dr. C. M. Wright has in former papers on prophylaxis proposed a subspecialty in dentistry. He urged the profession, in April 1902, to establish a special practical course in dental colleges for the training of cultured women in one line, viz, the polishing of the teeth and the prophylactic care of the mouth.

Dr. M. L. Rhein of New York has suggested the special education of the "dental nurse," but I had not seen his suggestions and plans before this paper was prepared. The colleges have not accepted Dr. Wright's suggestion, and I have not heard that Dr. Rhein's plan has materialized, but would suggest that each dentist who recognizes the importance of this work, and who himself cannot, or will not, thoroughly do the work—for which there is such a crying necessity among educated and refined people—should proceed to train his own assistants in this branch of work, or refer his patients to operators who are familiar with it.

Thoroughness in dentistry means doing everything known to us to prevent decay of the teeth and the various degen-

erative processes in the oral cavity. Do we do this? I answer promptly that there is not one man in ten in the profession who does his full duty in this matter, not even among the "first-class" men of today. Here in Europe we are learning from Dr. Younger what can be done for teeth that have been neglected until they are ready to fall out, but are we learning to keep the teeth of all our patients in such a condition that they will not need the services of a Younger? That is what I want to ask you, and that is what I would like you to ask yourselves. Do elderly patients in your practice, who have been with you for ten or twenty years, have healthier gums and firmer teeth now than when they came to you? If they have, you have done your duty; if not, I say plainly, you have not done your duty by them, provided they have been willing to carry out your instructions.

What do we do to prevent the recession of the soft and hard tissues about the teeth? Do we not simply tell the patients, when they ask if anything can be done to prevent this recession of the gums from the necks of the teeth, that it is a process of nature, against which we can do little or nothing?

Those who have followed the papers or writings of specialists know that careful and frequent polishing of the necks of the teeth with hard-wood polishers and pumice powder, together with massage of the gums, will prevent this recession and bring the receding tissues down again, and that improper or too much brushing with unsuitable brushes is a cause of recession. That this is the case is proved by the fact that the gums do not usually recede on the palatal surface of the teeth, on which only the tongue does the cleaning. If I may diverge a little from my set theme, I will give you a hint of a method I have discovered and practiced, and which I will soon present to the profession more fully, for remedying the recession in far advanced cases. Take as an instance the case of a canine the overlying gum of which has receded far up along the face of the root, but is still in its normal

place on the approximal sides of the tooth, exposing a brown, bare neck and a long conspicuous root, the line of gum recession extending—U-shaped or V-shaped—up the root. About a millimeter under this receded gum you will find the receded alveolar margin, with its corresponding periosteum. First inject a local anesthetic which does not contain adrenalin, and in the gum to be operated on make a tent-shaped incision one and one-half or two millimeters from the margin of the gum from the eminence over the lateral to that over the first bicuspid, and dissect away the periosteum with the gum flap. Prior to the operation the neck of the tooth is thoroughly cleansed and burnished, as one would burnish and polish a gold filling.

The loosened flap of gum, with the periosteum, is now brought down to a distance of one or two millimeters from the upper wound edge, leaving an open wound filled with blood. One or two sections or a coil of a root-canal lead point is cut and laid in the wound in order to retain the space thus gained, and to keep distended the gum flap with its corresponding periosteum at the neck of the tooth. I have devised a small platinum-wire gauze distender to keep the flap in place, and to protect the wound from lip friction until new granulations and new bone tissue have filled the space in the wound. As soon as the blood coagulates in the wound, the distender is adjusted to place, and the patient is instructed not to touch the gum for ten days with a brush or any other irritating substance—which would remove the clot or the new granulations as they are formed. Sometimes it is necessary to cover a large wound with a little plate of gold or other rigid material attached to the teeth, in order to prevent the lip from forcing out the coagulum and the new granulations which begin to form soon after the operation. In a month or two after the operation the same procedure can be repeated, if the gum has not been fully brought down. By repeating the operation the gum may be successively carried down to the desired place, as it is not advisable

to bring it down more than one or two millimeters at a time, allowing the wound to heal and new gum to form before repeating the operation. With these few words of interruption, let us continue to consider what is understood by thoroughness in dentistry.

Our greatest problem in dentistry today is preventive dentistry, which of course includes the prevention of pyorrhea alveolaris, a disease which is the result of the dentist's or the patient's neglect of the premonitory symptoms. My own practice confirms the opinions of multitudes of writers, who claim, as Dr. D. D. Smith of Philadelphia does, that perfect cleanliness of the teeth above and below the gingival margins will prevent this common but dreadful disease and a large percentage of cases of caries. In fact, it may be laid down as an axiom, that any tooth whose surfaces and natural or acquired defects are kept constantly clean will not decay.

The great difficulty in this connection is that it is impossible for the patient to constantly keep every surface of each tooth—including the approximal surfaces and deeper defects in the enamel—perfectly clean. Consequently, decay is bound to occur sooner or later, in spite of the combined efforts of patient and operator, unless we use some chemical substance such as silver nitrate, that will penetrate those defects which it is impossible for the patient or dentist to keep clean.

We must do our duty by our patients by treating as thoroughly as possible all local conditions, but we should likewise advise them concerning diet and exercise. Every person with a tendency to pyorrhea should be advised to avoid nitrogenous foods, and to drink freely of such waters as Lithia, or Eptingen, and to take at suitable intervals doses of Basel-Land or Sal hepatica, or to follow a *régime* that his family physician may plan out for him. These waters should be drunk before retiring, to assist sleep. Outdoor exercise is, however, the panacea.

The method of using antiseptic mouthwashes recommended by my colleague

H. B. Respingier is the most efficacious—viz, before retiring, and while preparing for bed, the mouth-wash should be held in the mouth and rinsed about forcibly between the teeth for at least five minutes; and two or three changes of the water, using it for about ten minutes, is even better. Hydronaphthol mixtures made palatable are useful antiseptic solutions.

There are three ways of doing thorough work, and of doing our duty by our patients and ourselves. If the number of patients is too great to enable us to do them full justice—(1) One should recommend the patients requiring special work to practitioners one knows will do justice to this special work. (2) Secure the services of an able and thoroughly qualified assistant, and train him to one's own methods of practice. Or (3) raise fees, so that those who do not appreciate thorough work may go elsewhere. The latter course does not usually work well in reducing a practice, because those who are thoroughly treated, and have confidence in the operator, will gladly pay a higher fee as their dentist becomes more able and efficient, rather than go to another man not so careful of every detail; and if they do, they will return to you upon finding that they are not being thoroughly looked after, and that their dentures degenerate every year and become less useful at that period of life when they are mostly needed—"when the sound of the grinding is low."

The demanding of high-class fees will never be a detriment to the man who can do the best work, and is thorough in his practice; who will never undertake to receive a new patient without being assured that he wants the best dentistry can do for him, and will do that work so that the patient's dental organs will be in the best possible condition, not only for immediate use, but also for old age. Do we all look forward to the old age of the patient, or do we not do what is needed today, and let the future take care of itself? This is one of the main points of this paper—to induce you to look forward, not only in making fillings

at so much apiece, but to assure yourselves that you are doing such work for your patients every year or every month as will insure a useful set of natural teeth from youth to old age. This cannot be done by examining a patient's mouth only for the purpose of ascertaining how many fillings are needed, or can be made at each visit. Dentistry today is not simply the filling of carious teeth. It means keeping your patients' mouths so that they, like wine, will improve with age. When we can look in the mouth of an eighty-year-old patient whom we treated for pyorrhea twenty or thirty years ago, and see gums and alveoli like those of a man or woman of twenty-five, with his once loose teeth as solid as the others—then, and only then, can we take pride in our work.

The average dentist of today seems to think that when he has filled all cavities, and spent a half-hour in scaling off the worst of the tartar accumulations, he has done his duty by the patient, and I find that this is the popular belief with the majority of patients, until they learn from a thorough operator what modern methods can do for them. The thorough dentist, after looking for cavities and noting them carefully, should prepare casts of the new patient's jaws and teeth for the purpose of future study, in order to find out all points of malarticulation which one cannot discover except by a study of casts—so that they may be corrected by grinding; and for various other purposes and reasons. I have in a former paper entered so fully into the reasons for preserving the casts of all our regular patients, that I will not further remark on this important subject. In the field of preventive dentistry there is much opportunity for reform at the present day. I will also refrain from describing my published method of treating all frail teeth with silver nitrate for the purpose of preventing decay, but I will ask you to consider with me some additional preventive methods.

We all know where decay is most liable to occur. The first trouble is with the deciduous molars; these molars may

cause decay of the first permanent molars at the same time and place that they have for thousands of years. We have a valuable method of preventing this first decay which occurs in the mouth, in a modification of the old and now discarded Arthur method of grinding the deciduous molars only.

We all know that our most dangerous cavities before the age of six are to be found in the approximal surfaces of the eight deciduous molars. Now, if we know just where we should expect decay, and discover it in its incipience, and will grind off the distal surface of the decayed first deciduous molar, so as to form an inclined plane, exposing the two cavities, and leaving a free space, which, however, must not extend below the gum but must leave a shoulder at the gingival margin, we will have perfect access to the cavities; and it has been my experience that this is absolutely the only way to get at the deciduous molar cavities in children of from four to eight years of age, in order to fill them so thoroughly that they will resist future decay and prevent the loss of pulps, a condition so often occurring in the very best practices, and for the very best little patients.

Where we attempt to fill these cavities in deciduous teeth after the contouring methods we adopt for the permanent teeth in patients of mature age, we often fail, and lose pulps. This V-shaped space which we prepare in the first deciduous molar gives thorough access to the cavities, and a degree of assurance that the fillings will last, as it forms self-cleansing spaces—and by "self-cleansing" I do not mean spaces one must cleanse oneself. Soon after the eruption of the first permanent molar, if we should find the slightest decay on the distal surface of the second deciduous molar, we should in the same manner grind away the distal surface of the latter tooth, in order that we protect the newly-erupted permanent tooth. Since I have adopted this method I have lost very few pulps in deciduous molars under ordinary circumstances, and it is a method to which young children easily

submit. Such cavities, if taken in time, and if the ground surface on each tooth be touched with silver nitrate, very often require no filling at all, as the cavity is almost entirely ground away. I consider this as a method of doing thorough work for children.

In speaking with dentists in regard to the cause of this neglect of thorough cleansing, which requires hours of work for its thorough performance, instead of minutes, as is usually the case, I find that they offer as an excuse that "Our time is all taken up by filling and the other more remunerative operations. If we would thoroughly cleanse the teeth and polish them below the gums after removing the serumal deposits, the patients would not pay us as willingly for that work on the 'per hour' basis, as they do not appreciate the necessity for such treatment until the teeth and gums have gotten into a very bad state; then, of course, it will take sometimes hours, not minutes, to improve their condition." Another says, "It is beneath my professional dignity to do this unskilled labor, this dirty work, which the patients themselves should do. If they brushed their teeth properly and with proper powders and used silk, they would keep them thoroughly clean. I do my part; I take off the hard tartar above the gums and below them, when I see it. I give them silk to use between the teeth, orange-wood sticks to remove what the silk and brush fail to remove; but they do not use them, not one in ten." Many patients do not co-operate with us and do as we instruct them, and still expect us as dentists to keep their teeth and gums in good condition. To do this for the careless patient would necessitate our seeing them at least every three months or every month, as many dentists do now in America. We should devote at least one hour or two every month to simply cleaning their teeth where they need it the most—where the brush does not reach, and where decay occurs most frequently.

Another point of thoroughness, which it took me over twenty years of practical experience to learn, is not to adapt one's

work in one row of teeth to a deformed and irregular bite on the opposite jaw. For instance, if a lower bridge is to be made which would have to articulate with a row of irregularly placed molars and bicuspid, do not make the bridge to conform to the abnormally placed, and elongated teeth. Elongated and irregularly opposing teeth should be heroically ground. If one of them be elongated to such an extent as to cause an imperfect articulation, thus failing to produce a good masticating surface if left undisturbed, devitalize it, cut it down, and crown it. Grind the remaining teeth to proper form and alignment after studying the case on articulated casts of the mouth. One single tooth should not be allowed to stand in the way of producing a perfect articulation. Teeth that articulate correctly are less liable to decay than when one tooth is long, and its neighbor short, and the process of mastication cannot consequently be normally performed. Every new case should be studied on casts, and a plan of treatment made of what is to be done to give the best final results. If desirable, this plan of treatment may be explained to a new patient on the casts. One can never satisfactorily explain or have a clear understanding of all conditions without the assistance of casts, which may be studied at one's leisure. The dentist can then go over the case with the patient, and the same casts will, when compared with casts of the finished case, convince him of the advantage of the work done or to be done. One should not ask the patient about how the work should be done. I do not discuss these points of practice, even if the patient should happen to be a dentist. Be assured that he wants the best thing done, and if it be a case requiring a large amount of work, give the patient an idea of the cost and let him decide if he can afford it; then carry out your plans without further reference to him about details and methods.

If a patient puts himself in the hands of the dentist and has confidence in him, it is seldom advisable to discuss with him methods of practice. Do not ask the pa-

tient if he is willing to have a pulp devitalized or an irregular tooth ground. If such operations be necessary, do them regardless of the patient's opinions in the case. If he objects to what in your opinion is necessary in order to make a perfectly satisfactory operation, it is decidedly better to let him go, than to do unsatisfactory work. If we must do something against our judgment, as occasionally occurs, the patient should be given to understand that it is done without any responsibility on the dentist's part, and it should be made clear to him that it must not be spoken of to others as a sample of one's work, if the work is not perfectly satisfactory to the operator, and has been done as a compromise with the patient.

I consider those dentists especially lacking in thoroughness who treat their patients from one toothache to another and never undertake a thorough examination of all the teeth, in order to put them all in perfect order, regardless of time and cost. Let the greater expense come once, for then the mouth may be kept in a normal condition from year to year at a small outlay, not to mention the source of comfort and usefulness which such a mouth and teeth will be. The patient should consider this first outlay like that incident to the building of a house; it usually occurs but once in a lifetime. A new patient should always be made to understand this point, for then few will object to the expense.

Not one patient in twenty-five, in a practice in which thorough work is the rule, should ever suffer from toothache. This should be as rare an occurrence in a first-class practice among our regular patients, as extractions are now among people who attend regularly to their teeth.

Discussion.

Dr. HIRSCHFELD thought that the essayist should have laid more stress on the subject of thoroughness in filling teeth. There is another factor in the case, he said, which should not be disregarded, namely, the peculiarities of the patients

upon whom we are called to operate. In the United States patients have been educated to a proper appreciation of dental services conscientiously rendered, and to submit unprotestingly to the pain which usually accompanies their thorough performance. In European countries, especially in France, the work of educating the public to this appreciation of dental services is as yet in its infancy, and consequently dentists, even though they be extra-conscientious, are frequently hampered in the pursuance of their professional work according to the standard laid down by the best operators in other countries.

Dr. WETZEL stated that thoroughness is not possible, unless the dentist have the sympathetic assistance of his patient, and of the parents or guardian of the very young patients, who should be placed under the care of the dentist at a very tender age, in order that he may have the opportunity of caring for their teeth at regular intervals.

Dr. ROUSSEL indorsed Dr. Hirschfeld's views, stating that while in America the teeth are considered by the layman to be valuable as masticatory organs, in Europe they are valued mostly for cosmetic reasons. He further added that surgeons and physicians have much to learn in the line of dental hygiene, for while they take all possible anti-septic precautions prior to operating, they too seldom take—in similar circumstances—pains to clean their own mouths or those of their patients—two very plausible sources of surgical infection.

Dr. DABOLL argued that the difficulty with European patients is due to a lack of dental education by the dentist, and to the prevailing system of computing charges for professional services, inasmuch as in France a dental fee is gaged by the nature of the filling material employed, rather than upon the basis of the time consumed in performing the operation.

Dr. HIRSCHFELD reiterated the views he expressed in opening the discussion of Dr. Bryan's paper, insisting that the unavoidable infliction of pain in the

course of dental operations is the greatest hampering influence toward the thorough performance of dental operations on French patients. The French patients, as a general rule, when confronted with the choice between a solid gold filling requiring about an hour for its insertion and a cement filling inserted in much less time, will choose the latter, although knowing that it will have to be re-inserted at intervals of about two years.

Dr. HOTZ confirmed Dr. Hirschfeld's opinion, saying that his patients were always willing to visit him two or three times a year, to have the same operations performed over again, provided they were done painlessly. However, many patients are not always satisfied to remain in the chair for two hours, especially

when they know that the operator's fees are computed on the time basis.

Dr. BRYAN inquired whether it was customary with European patients to visit the dentist every two or three months in order to have their teeth cleaned and polished. Patients highly susceptible to caries, he stated, should submit to such treatments every month.

Dr. WETZEL stated that he did not believe that the teeth invariably decay in mouths that are not kept in perfect order, and *vice versa*, for he had seen patients whose teeth decayed in spite of thorough cleanliness.

Dr. BRYAN, in closing the discussion, expressed the wish that the members of the club would adopt the methods described in his paper.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JULY 1907.

EDITORIAL DEPARTMENT.

DENTISTS AND THE INTERNATIONAL MEDICAL CONGRESS.

THE communication from Dr. Miller upon this subject which appears elsewhere in this issue relates to a recrudescence of an ancient and rather careworn activity which in these modern days of scientific progress we had supposed was in a somnolent if not moribund condition. It is nothing less than an attempt upon the part of a misguided minority to make it appear that a class distinction can properly be drawn between the practitioners of one department of the art and science of healing and the practitioners of certain other departments of the same calling. The spirit of the movement is a relic of medieval barbarism, the spirit which originated and fostered the guild laws; that united in individuals of one class the office of priest and physician at a time when popular ignorance and superstition enabled the composite doctor-priest to command a reverence for his office second only to that accorded to the Almighty, and to rule with undisputed power over the minds and physical well-being of mankind.

In the progress of the ages the light of truth developed through scientific observation and investigation has slowly but surely changed the conditions under which the doctor-priest flourished. The bulwark of ignorance and superstition by which he was surrounded and which constituted his chief support, as well as his *raison d'être*, has gradually disintegrated before the general enlightenment of the people, and the vast aggregation of facts wrought out in the minds and laboratories of investigators has so increased the sum total of ascertained knowledge of the healing art that the mind of no single individual can now compass and contain it. Hence it is that specialism in the healing art has become a practical necessity, the first step toward which was taken when the line of cleavage was opened between the functions of the priest and the physician, whereby the ghostly office became wholly vested in the priesthood and the care of the body was accorded exclusively to the physician.

But the same factors that brought about the first division continued operative. The field was persistently enlarged by constant increments of new knowledge and more specialized skill, leading to a division of the art of healing which relegated the surgeons and obstetricians to separate subordinate classes, along with the apothecaries and barbers, as outside the pale of medical respectability, and consequently as beyond medical recognition. These ancient specialties, though originally recognized as integral parts of the healing art, each in course of time grew in importance—grew because, dealing as they do with vital problems affecting the health and comfort of the human body, they were intrinsically important; and because of their vital importance the field of knowledge pertaining to these specialties was assiduously cultivated, as was also that of every department within the recognized sphere of the physician, so that in the course of time both the surgeon and the obstetrician sought and obtained formal recognition in the shape of legal reinstatement within the sacred fold of medicine. Although general medicine had not itself attained to the position where its followers bore the hall-mark of their calling in the shape of a medical degree, nevertheless the characteristic class sentiment, its prejudices, its pride of position, its foundations of organization, were distinctly evident and were so far militant as for the time being, at least, to offer stubborn

resistance to any attempted invasion of its sacred precincts by any who were not adjudged to be clearly entitled to its rights and privileges by training and education in accordance with prescribed standards.

Surgery under these conditions languished long among the socially degraded and unlettered occupations of mankind, until under the protection of the guild laws it developed to a point when in France, in 1690, a patent of nobility was conferred upon Felix the barber-surgeon of Louis XIV as a mark of royal gratitude for successfully curing the king by operation of a fistula-in-ano after the court physicians and many others had failed to give him relief. The ennobling of Felix gave to the barber-surgeons of France a social and professional status equal to that enjoyed by the physicians, in consequence of which the medical faculty exhibited much opposition and resentment to the new order, but which nevertheless so popularized surgery in general and rectal surgery in particular that the year 1686, the date of Louis' operation, was called among his courtiers "the year of the fistula," and so popular was that particular aristocratic disorder that to have been its victim and to have undergone the king's operation became a mark of high distinction. In England the separation of the barbers from the surgeons and the professional recognition of the latter took place in 1745.

In a general sense the same spirit of opposition manifested by the medical faculty in the time of Louis XIV toward the exaltation of the barber-surgeons of the period has been subsequently manifested in varying degrees toward each class of special practitioners of the healing art as they have, in response to the demands of the time, severally arisen; and particularly has it been so with regard to the specialty of dentistry.

It is unnecessary to here recite the history of this opposition, nor is it necessary to rehearse its details. That the physician has always regarded the dentist as outside the pale of his professional affiliations is a matter of historical record. There is this, however, to be said in connection with the question as it has manifested itself in various ways since dentistry became an organized profession upon an autonomous basis, viz, the points of frictional contact between organized medicine and organized dentistry have been gradually growing less in the course of time.

The progress of the world's thought and enlightenment has led to more rational thinking and is eliminating prejudice. And as science and scientific methods are replacing ignorance and empiricism, in just the same ratio is greater tolerance and respect being developed among all workers for the human weal, workers in the healing art included.

A comparison of present conditions with those of the past as regards the relationships of medicine and dentistry is of more than passing interest. When dentistry effected its professional organization in 1839-40 by the creation of its journal, its college, and its association, medicine could with no degree of justice have been called a scientific profession in any such sense as that phrase is now applied. Much was claimed for it, and properly so, by its votaries: it was one member of the tripos of so-called learned professions; it claimed for itself everything to which it was entitled, and much more; it was a composite of a modicum of scientific fact and a superabundance of speculation dignified by the title of "theory." All that was actually known about medicine, so far as its basis of real fact was concerned, could be easily learned by a student in a few months; and the rest being unessential and speculative, he could do without it or create a respectable substitute for it out of his own imagination. Hospital practice was not required, as a few months' association with the old family doctor in the capacity of assistant was a practical and in many cases an efficient substitute. It was the era of calomel and jalap, clysters and phlebotomy, and but little more; the votary of Æsculapius, armed with his license to kill, went about his business and did the best he could under the circumstances and the means at his command.

In dentistry the conditions were parallel. The turnkey was the symbol of dental surgery; human teeth had "fangs" in those days; they did no prosthetic operations, but "put up a job in metal" or teeth of "carved sea-horse ivory," according to the fancy and financial condition of the patient. The dentist was essentially a mechanic; about the vital relationships of his professional work he knew little, even of what little there was to be known. Weak as medicine was, dentistry was worse, and that there should have been a strong opposition upon the part of medical men toward the recognition of dental practitioners in the

early days is not at all surprising. Such an attitude once established readily becomes habitual and difficult to shake off; therefore it is not remarkable that it should persist and make itself evident by periodical outbreaks.

On the whole, the men who are representative of the advanced thought in medicine know and recognize the best that has since been attained in dentistry, both in its art and its scientific aspects. That such is the case is evidenced by the cordial and formal recognition that has been given to dentistry in several of the world's medical congresses and national medical associations. If occasionally some narrow-minded committee of organization succeeds in forcing its hereditary prejudices into prominence, as was done at Lisbon and is now to be done at Budapest, it must be regarded by discriminating men both in medicine and dentistry as merely an incident in the turn of the political wheel which has given some men or group of men an opportunity to exhibit their narrowness; and, while unpleasant, it is without any important bearing upon the real relationships of the two professions.

Unfortunately, there is a small group of men who are practicing dentistry, who have appended the insignia of medicine to their qualifications and who because of their medical appendix have all the medical prejudice toward the dentist, whatever else they may have failed to acquire in the way of medical culture. Too often the medical degree is thus worn not because of the more efficient added training which it represents, but because of an assumed respectability which it is supposed to confer. Fortunately, this variety of dentist is a minor factor and is of importance only to the extent that he is a disturbing element as between the two professions.

The suggestion offered by Dr. Miller and voiced by the two societies to which he refers indicates, in our opinion, the only sensible course that can be pursued with regard to dental representation in the International Congress of Medicine at Budapest. No dignified person would go where he was not wanted, certainly not where he had been invited to stay away, and the dentist who does attend the Budapest Congress, by that act will dissociate himself from affiliation with the dental profession, and the dental profession should so regard it. In the course of time conditions

will be so changed that pre-existing relations will be established and dentistry will take the position in medical relationship that has already been officially accorded to it and which has been heretofore mutually satisfactory.

Dentists, Stomatologists, and International Medical Congresses.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Two years ago the dental world was not a little surprised to hear that dentists not possessing a medical degree could not be admitted as members of the International Medical Congress at Lisbon.

A second surprise awaited us in the form of a resolution passed on December 19, 1906, at a meeting of the committee of organization of the Sixteenth International Medical Congress to be held at Budapest in 1909. This resolution likewise provides for a stomatological section to which practitioners of dentistry not possessing a medical degree are not admitted. Dentists have reason to complain of this action, since they have always extended the hand of fellowship to stomatologists and gladly admitted them to their meetings, national as well as international, even when they have not been in possession of a dental degree.

I propose to present a full consideration of this question in one of the succeeding issues of the *DENTAL COSMOS*, and shall not discuss it further here, my object at this writing being to bring to the notice of the dental profession in America certain resolutions introduced by me at the last meeting of the Central-Verein Deutscher Zahnärzte (National Dental Association of Germany) and unanimously and enthusiastically adopted. These resolutions read as follows:

"The Central-Verein Deutscher Zahnärzte takes notice of the fact that the committee of organization of the Sixteenth International Medical Congress, to be held at Budapest in 1909, in its meeting held December 19, 1906, adopted rules which exclude dentists who have not passed the examination as Doctor of Medicine from membership in the congress. This action causes surprise, inasmuch as, with the single exception of Lisbon, all former medical congresses admitted dentists without question; and it is all the more surprising in view of the fact that dental science has been making rapid strides forward during the past years and its importance as a branch of general medicine is being recognized more and more by the public as well as by the medical profession. As over ninety-five per cent. of the dental profession in Germany are slightlying treated by the above action the C. V. D. Z. together with the doctors of medicine present at the meeting, unanimously resolves that it would consider it as a mark of deficient professional pride if any German dentist in possession of the requisite medical degree were to attend the stomatological section of the coming congress at Budapest. The German dentists, having never undertaken steps of any nature whatever which were in any way calculated to interfere with the rights of the stomatologists, must resent any action on their part leading up to measures antagonistic to the interests of the dental profession.

"The C. V. D. Z. acknowledges with pleasure the communication received from the representatives of the Austrian stomatologists, and the loyal stand which they take, and will zealously endeavor to uphold the

friendly relations which have always existed between German dentists and their stomatological colleagues in Austria."

"The C. V. D. Z. presents a copy of this resolution to the International Dental Federation and begs the Federation to protest to the committee of organization of the Budapest congress against the exclusion of dentists, and also either directly or through its national committees to call upon the national dental associations of all countries interested to adopt similar measures."

Yours truly,

W. D. MILLER.

*In this communication the officers of the Verband Oesterreichischer Stomatologen expressed their disapproval of the action excluding dentists from the Sixteenth International Medical Congress.

BIBLIOGRAPHICAL.

PLASTER OF PARIS AND HOW TO USE IT.

By MARTIN W. WARE, M.D., Adjunct Attending Surgeon, Mt. Sinai Hospital; Surgeon to the Good Samaritan Dispensary, etc. 12mo.; 72 illustrations, 100 pages. New York: *Surgery Publishing Co.*

The book by Dr. Ware, although intended primarily as a contribution to the literature of plaster of Paris in surgery, also contains a chapter on plaster of Paris in dental surgery.

In dentistry, plaster of Paris is employed with relatively greater frequency than in surgery, and for purposes which require that the manipulator have a thorough insight into the properties and behavior of the material and a reasonable degree of technical and artistic skill. Consequently, the average dentist is by far better acquainted with the properties of this material than is the average medical or surgical practitioner. Considerable time has been devoted of late years by members of the dental profession to the study of the behavior of plaster of Paris under conditions such as are met with in the preparation of accurate im-

pressions and casts, and anyone intending to produce a work on the subject would do well to review its literature as recorded in dental books and periodicals—for in them is to be found an array of valuable conclusions and suggestions such as are entirely lacking in the book now before us.

While the reviewer would not presume to pass critical judgment on the value of the surgical aspect of the book, he does feel that the portion of the book devoted to the uses of plaster of Paris in dentistry is decidedly incomplete, and that in addition it contains statements which are both erroneous and misleading. As an evidence of this let us turn to page 73, where the statement is recorded that "all varieties of commercial plaster will make good models." It is common knowledge among dentists that all varieties of plaster are not suitable for making casts, for the reason that not every kind is of the slow-setting variety, which produces casts of greater hardness than those which would result from the use of "impression plaster"—a finely ground, quick-setting material. Neither

would it be advisable to make casts of many of the impure commercial varieties used in the arts and in building construction.

We also disagree with the author in regard to the statement that impressions of a fractured jaw should not be taken in plaster of Paris, for it is well known that this material, when mixed thin, will take impressions of fractured jaws without the necessity of subjecting the patient to the additional and unnecessary degree of discomfort and pain incident to the displacement of the parts by the pressure required to force to place such materials as modeling composition or wax.

The illustrations of plaster impressions and casts in the dental section of

the book are of such a character as to call for most unfavorable criticism, not to say condemnation, especially in view of the fact that a request to any publisher of dental books or periodicals would have made it possible for the author to present to his readers good half-tone reproductions of carefully made casts. But, as it is, the dental illustrations are but inferior reproductions of badly made drawings which as a matter of fact represent defectively made casts and impressions.

In view of the foregoing criticisms, the book cannot be considered in the light of a specially useful addition to the literature on the manipulation and uses of plaster of Paris in dentistry.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE

Conducted by JULIO ENDELMAN, D.D.S.

[*American Journal of the Medical Sciences.*]

INFANTILE SCURVY: ITS MANIFESTATIONS AND DIAGNOSIS. By LINNÆUS EDFOED LA FÉTRA, M.D., NEW YORK, N. Y.

Infantile scurvy is a comparatively new disease, having been recognized for less than twenty years. In the periodicals devoted to pediatrics, reports of cases of infantile scurvy began to appear about 1890. Even at the present time, physicians do not always keep in mind that scurvy may occur in infancy, so that they often fail to recognize the disease. During the last two decades, the very common use of dried, proprietary infant foods, or of sterilized milk, has greatly increased the number of cases of infantile scurvy.

The name of infantile scurvy was given to the disease under consideration by Barlow, who showed the essential nature of the disease. He summarized the chief features as follows:

"(1) Predominance of lower limb affection with (a) immobility, with the knee slightly flexed and the thigh rotated outward, often with pseudo-paralysis; (b) excessive tenderness; (c) general swelling of the lower limbs, due for the most part to sub-periosteal hemorrhage; (d) skin shiny and tense, but seldom pitting, and without undue local heat, (e) thickening of the shaft of the bone, made out when the swelling has disappeared; and (f) liability to fracture near the epiphysis. (2) Swelling of the gums, varying from definite sponginess down to minute transient ecchymoses.

"The conditions mentioned constitute the chief diagnostic criteria between scurvy and rickets in children. To these should be added—(3) The tendency to hemorrhage either into the skin, subcutaneous tissues, mucous membranes or rarely into the viscera, and (4) the definite and rapid improvement under anti-scorbutic diet."

The author describes in detail seven cases of infantile scurvy, the symptomatology and treatment of which may be summarized as follows:

Case I. Patient, infant eight and one-half months old. Pain, tenderness, and swelling in the lower extremities; blueness of the gums; pseudo-paralysis of the legs. Developed while taking sterilized milk. Treatment for twelve months, ending in recovery, consisted of orange-juice and beef-juice, a teaspoonful of each three times a day.

Case II. Patient, infant eight and one-half months old. Tenderness of thighs and ankles, swelling of the gums, and pseudo-paralysis. Developed on pasteurized milk. Treatment as in the previous case, with the addition of purée of potatoes. Recovery.

Case III. Patient, infant twelve months old. Tenderness; blood-blebs over the gums; pseudo-paralysis. Developed while taking milk that was not heated when prepared, but over-heated when warmed for the bottle feeding. The chief complaint was that the baby cried when the stockings were being put on, or when the legs were moved. The food was continued exactly as above, save for the heating, which was discontinued; orange-juice and beef-juice were added. In one week the baby had improved so that it could be moved without crying. She recovered entirely from the scorbutic symptoms in two weeks.

Case IV. Patient, infant ten months old. Bloody urine; tenderness of the extremities; bleeding from the bowels. Developed on pasteurized peptonized milk. At first there was no pain in the joints, or change in the gum. Later on, and after the eruption of two central incisors, the gum around these teeth became dark purple and swollen. The child cried after moving the lower extremities; the arms were moved without pain. The treatment consisted in putting the child on raw modified milk, suitable for a three months' baby, and in the administration on the first day of one ounce of orange-juice and one-half ounce of beef-juice; and on the following days double the amount of each. On the sixth day, the gums returned to normal condition. Bloody urine was the first sign of scurvy in this case; following this came tenderness of the legs, and blood in the stools; next were seen the blood-blebs around the teeth, and finally the petechiæ.

Case V. Patient, infant twelve and one-

half months old. Blood in the stools; swollen and bluish gums. Developed on a weak milk mixture made up with starchy food. Treatment consisted in the suppression of the starchy food and in the administration of two ounces of orange-juice and two ounces of beef-juice. The food formula consisted of two ounces of mixed milk, raw, two ounces of lime-water, and six ounces of water. In this case the blueness and puffiness of the gums was the chief symptom.

Case VI. Patient, aged fourteen months. Spinal tenderness; pain in the legs; blue spots and some swelling below the knees; blueness and puffiness of the gums and a bruise-like discoloration of the soles of the feet. When the child was at its worst, the gums would bleed. A diet exclusively of fresh food, with raw milk and animal fats and orange-juice at the onset of the attack, brought about complete recovery in two months.

Case VII. Stiffness and swelling of one knee simulating arthritis. Developed while taking a proprietary food with heated milk. There was tenderness in the legs but no swelling or bleeding of the gums. A diet of fresh mixed milk and orange-juice, increased to four ounces daily, brought about a cure in a few weeks.

The author, in concluding, discusses the symptomatology, pathology, diagnosis, differential diagnosis, and treatment of the disease under consideration.

[*L'Odontologie*, Paris, April 30, 1907.]

A CASE OF ACTINOMYCOSIS. By DR. L. BIGAIGNON, PARIS, FRANCE.

The patient, a man aged thirty-two, was of delicate constitution. His clinical antecedents, however, were good, as they included neither tuberculosis nor syphilis. For about two years a swelling had existed on the right side of the mandible. He had tried several ointments, but without any success. A month after the appearance of the swelling, the skin became violaceous, and assumed a cicatricial and parchment-like appearance. It was at this stage in the progress of the disease that Dr. Bigaignon examined the patient. He found that the right side of the face, including a portion of the neck, was decidedly abnormal in appearance; the skin, purplish in color, was adherent to the bone,

and at separate areas two fistulæ with fleshy borders were to be seen. Pressure upon the affected area caused no pain whatever, but gave rise to a granular discharge, which, when examined under the microscope, showed the characteristic radiating form of the actinomycosis fungus. In the mouth, conditions were not any better. The gum was tumefied and swollen, and the roots of the bicuspidæ—which could be seen in their respective sockets—were badly broken down and infected. Having reached, with the aid of the microscope, the positive diagnosis of actinomycosis, the infected roots were at once extracted, and it was then seen that the facial fistulæ communicated with their sockets. Potassium iodid was then prescribed, the author thinking that, as in the previous cases treated by him, a cure would promptly follow. The iodid was given in increasing doses. During the first few days forty-five grains *per diem* were given, but after about one week, as no improvement was noticeable, the dose was increased to sixty grains *per diem*, when again, after a wait of four days, it was increased, this time to seventy-five grains. One week's administration of the latter dose having brought about a slight improvement, the dose was now carried to ninety grains, and continued for a period of about ten days.

At this time it was found that the swelling had decreased to about one-fourth of its original size, that the puffiness of the face was not so marked, and that the skin, although still parchment-like in appearance, was of a rather pinkish color. The fistulæ had disappeared, but in their place a swelling was to be seen, showing that the tissues had not as yet resumed their normal character. The improvement lasted for only a few days, when another fistula appeared very near to where the previous ones had been located. The administration of the iodid was continued, but the doses were gradually decreased, as the large quantities which the patient had already taken had exerted a debilitating influence upon his digestive system. He was advised to make a sojourn in the country, and there remained without any treatment for about a month. At this time, of his own will, he again began the iodid treatment, taking at first forty-five grains *per diem*, and gradually increasing the dose to ninety

grains. After reaching this maximum, the dose was decreased to about fifty grains *per diem*. An examination at this time showed that the swelling in the mandible was still large. There was also a small fistula, and a slight adhesion of the still violaceous skin.

The medicinal treatment was now changed, discarding the potassium iodid in favor of the iodo-peptones, of which preparation the patient was instructed to take five drops in water three times a day. This dose was gradually increased to fifteen drops twice daily, and continued for about a month, when the patient was pronounced cured.

The case here reported by Dr. Bigaignon is unusually interesting, on account of the severity of the attack, the iodid treatment having failed to bring about the expected results until after a continued administration over a period of six months, whereas ordinarily, an actinomycosis infection can be eradicated under the same treatment in a few weeks.

[*La Odontología*, Madrid, May 1907.]

A CASE OF EXTENSIVE PERFORATION OF THE SOFT PALATE CURED BY MEDICINAL MEANS. BY DR. MARTÍN, BARCELONA, SPAIN.

The author reports the case of a man aged twenty-eight years, who ten years previously had become infected with syphilitic virus. He had been suitably treated for a while, but apparently not for a sufficient length of time to prevent the formation of gummata, the reason for which he sought the services of Dr. Martin. The patient presented a gummatous ulceration in the soft palate, which with unusual rapidity—viz, in about three days—produced a perforation of about eight square millimeters in area and of marked progressive tendencies. Consequently it was decided to institute at once an active mercurial treatment by friction, and to treat the lesion locally with a solution of salol in tincture of rhatany.

In two days after the beginning of the treatment the progress of the lesion was arrested, and in a few more days the diameter of the perforation decreased considerably, the systemic phenomena becoming less evident. The continuance of the treatment eventually brought about the complete cicatrization of the palatal opening.

La Odontología, Madrid, April 1907.]

**PERFORATIONS OF THE SOFT PALATE
IN SCARLET FEVER.** BY DR. MERY
VD HALLE.

Perforation of the soft palate is one of the buccal complications of scarlet fever when the infection is unusually severe. There is a type of scarlatinal sore throat characterized by the presence of ulcerations, which may be either small or large, superficial or deep, and which develop very rapidly. If the necrotic process is of some intensity it results in a perforation, which appears spontaneously and without previous warning. This perforation, which as a rule is located at the center of the soft palate, has no tendency to spread, and assumes an oval form in the majority of cases. Scarlatinal perforations are rare and occur in children only, during the twelve days following the onset of the attack. The prognosis as a rule is very serious, and but a rare few survive the infection, of which the palatal perforation is perhaps the most serious manifestation. The local treatment should consist of applications of zinc chlorid 1:30. Should the patient not recover, a well-planned surgical intervention is the only means by which one expects to obliterate the opening.

tsche Zahnärztliche Wochenschrift,
Berlin, April 20, 1907.]

**RESORPTION OF THE ROOTS
OF A MOLAR IN THE COURSE OF SENILE
ALVEOLAR ATROPHY.** BY DR.
BAER, BERLIN, GER.

Dr. Baer reports an unusual case of resorption of the roots of an upper left third molar, the crown of which, apart from a structural defect in its mesial surface, was perfectly normal. The patient, aged thirty-eight, had been suffering for about two years from senile alveolar atrophy, and in addition, at the time of examination by Dr. Baer, he complained of pain localized in the upper left third molar, which was the seat of pericemental disturbance in spite of the fact that, as stated, the tooth was practically free of decay. The pain appeared at times suddenly, at other times on taking hot beverages.

On a full examination of the mouth revealed that the sockets of the upper left bi-

cusps and first and second molars had been the seat of a senile alveolar atrophy, as the result of which these teeth were but loosely held in their alveoli, and that the upper left third molar, although similarly affected, had not been loosened to the same extent as its immediate neighbors. At first the disturbance was diagnosed as pulpitis, and the small shallow cavity in the mesial surface was carefully excavated, lined with cement, and filled with gold. Subsequently, however, the patient returned, still complaining of pain in the same tooth, appearing as previously, either spontaneously or upon the tooth coming in contact with fluids, either hot or cold.

At this examination another very small and shallow fissure cavity was discovered and suitably filled. It was not considered possible, at the time, that sufficiently powerful stimuli could travel through the gold filling in the cement-lined shallow cavity to reach the pulp, and there set up the inflammatory phenomena responsible for the degree of pain which the patient had been made to endure. However, in order to eliminate all possible causative factors, the gold filling was removed, and both the shallow cavity in the mesial surface and the fissure cavity were filled with gutta-percha. This treatment again failed to relieve the existing conditions, as the patient reported soon afterward that since the insertion of the plastic fillings, the pain had been even more severe than before. Once more the fillings were removed and this time substituted by zinc oxyphosphate cement.

At a subsequent visit, as the patient reported no improvement, it was decided by Dr. Baer to extract the tooth, not only on account of the pain to which it was giving rise, but also because it was the seat of a pyogenic pericementitis; and furthermore it was of little value as a masticatory organ. As the tooth, by reason of the senile alveolar atrophy, was extremely loose, the extraction was easily performed. It was then found that two of its roots had been almost entirely resorbed, and that the third was in the first stages of the same atrophic process. Dr. Baer believes that consequent upon the atrophy of the alveolus a pocket was formed between the inflamed gum tissue and the root, and that through this avenue the pericementum and pulp became involved, thus giving rise to the pain from which the pa-

tient had for so long a time been a sufferer. The resorption was probably also responsible, to a certain degree, for the pain, inasmuch as such a phenomenon, when occurring in the roots of the permanent teeth, has been known to cause neuralgic disturbances.

[*New York Medical Journal*, April 13, 1907.]

THERAPEUTICAL NOTES.

(1) *Ointment for neuralgia:*

R—Mentholis, gr. xij;
Cocainæ, gr. iv;
Chloralis, gr. ij;
Petrolati, gr. lxxv. M.

Fiat unguentum.

Sig.—Apply to the painful part and cover with a gauze bandage, if the neuralgia is periorbital or hemicranial.

(2) *Mouth-wash for diabetics:*

Croftan, in the *Clinical Review*, recommends—

R—Beta-naphtholis, gr. v;
Sodii boratis, 3vj;
Aquæ menth. pip., f3vj;
Aquæ destillatæ, Oj. M.

Sig.—To be used as a mouth-wash.

Also, for *bleeding gums* the following should be used:

R—Tinct. opii, f3vj;
Potassæ chloratis,
Sodii boratis, āā 3ijss;
Decocti althææ radices, Oj. M.

Sig.—To be applied to the gums.

(3) For *constitutional treatment of alveolar abscess:*

R—Iodii sulphatis, 3j;
Aquæ, 5v;
Syrupus, 3j. M.

Sig.—One tablespoonful every hour.

The pain will subside slowly after three to four doses.

[*La Stomatologia*, Milan, September 1906.]

DIFFICULT ERUPTION OF A PERMANENT CANINE. By Dr. P. Boggio, MILAN, ITALY.

The case reported by the author was that of a boy aged eleven years, of robust constitution, in whom severe inflammatory phenomena developed consequent upon the extraction of a deciduous lower left canine, prior to the eruption of the corresponding permanent tooth. Two or three weeks after the extraction a tumor of purple color, with a blue spot upon its surface, developed in the area previously occupied by the deciduous canine. The blue spot when punctured gave rise to the discharge of a thick, black, bloody fluid. The tumor increased in size, and the pain to which it gave rise soon radiated along the mandible and toward the ear. Dr. Boggio lanced the tumor, thus causing the escape of a blackish discharge, and after applying the thermo-cautery exposed the permanent canine, which, from that time on, proceeded in its eruption without further trouble.

PERISCOPE.

Sterilize Polishing and Grinding—Brush clean with soap and water plate brush, and dip them in a five per cent solution of formalin in alcohol.—*e Record*.

Clean Impression Trays.—Put the tray in a piece of sal soda the size of a half a gallon of water and boil for five minutes. Take out the trays, and wipe them while warm.—J. R. HULL, *Western Dental Journal*.

aid in the Removal of Difficult Impressions.—If it be found difficult to remove an impression for a full upper denture, have the patient close the lips and blow with sufficient force to distend the cheeks, and the impression will drop down, no matter how deep it may have been.—R. C. TRAYNHAM, *Dental Journal*.

of the Handpiece.—After the day's use take the jacket off your handpiece and clean the bearing carefully; place the handpiece idle in a drawer separately for a week. In the morning a drop of oil is put on the bearing, and it's "just like new."—Adjust the bearings when needed.—TRICK, *Western Dental Journal*.

Hydronaphthol as a Pulp-Capping.—To remove the removal of the layer of softened dentin, which, if removed, would probably prevent the removal of the pulp, mix equal quantities of hydronaphthol and cement, and use the mixture as a capping for the dentin; after allowing it to set proceed with the filling. The hydronaphthol has no arterial action.—A. W. McCALL, *Federal Journal*.

Formula for Pharyngitis and Aphthous Stomatitis.—

Infusuræ myrrhæ,	20.0 gm.
Infusuræ opii camphorata,	5.0 "
Sol. rosæ,	30.0 " M.

Add to 150 gm. barley water, and use the solution for aphthous inflammation of the throat.—*Journ. de Méd. de Bordeaux*.

A Helpful Hint.—When treating a root canal it is often found difficult to remove the cotton wool from a barbed broach. The following device obviates that difficulty: Use a common smooth broach, warm it very slightly in the flame of the spirit lamp, and touch it with a piece of beeswax. The cotton wool adheres nicely to the waxed broach, and is easily removed by heating again.—*Elliott's Quarterly*.

Action of Tobacco upon the Teeth.—After smoking a Havana cigar, I made cultures of my own saliva, and found it had the effect of retarding the growth of bacteria more than had any of the mouth-washes I have experimented with. I took the culture just before the cigar, and then repeated every five minutes for one-half hour after smoking.

I am of the opinion that if smokers kept their teeth clean—that is to say, free from foul deposits—and allowed the smoke to percolate around them, they would on an average have much better teeth than have the non-smokers.—F. M. WELLS, *Dominion Dental Journal*.

To Tip Facings with Gold.—First use care in grinding the facing, reducing its length so as to allow for the gold tip when finished. The cutting edge should be beveled off at an angle of about forty-five degrees, being careful not to leave a feather-edge of porcelain at the labial surface, as it will chip out when finishing. Proceed as in making any Richmond crown, until it is ready for the solder. Take a sharp-pointed instrument and carefully scrape away the investment from the cutting edge until all the surface of the gold backing is cleaned to the labial edge, holding the instrument at right angles to the facing. Take some crystal or sponge gold and pack it in the triangular space you have made. Put on a little borax, place the solder, and flow it as usual. This draws the solder down and leaves the cutting edge protected by a gold surface. If properly done, not enough gold will show to impinge upon the conscience of the most esthetic dentist.—C. H. VAN DEVENTER, *Western Dental Journal*.

Relief from Toothache.—A small piece of absorbent cotton may be introduced into the cavity of a tooth, having been first moistened with the following solution:

R—Cocainæ hydrochloridi, 0.25–0.50 gm.
Mentholis, 2.0 "
Camphoræ, 1.0 " M.
Triturate until liquefied.

Sig.—Apply to the cavity of the tooth, and renew every half-hour until the pain is relieved.—ROBIN, *Journ. de Méd. de Bordeaux*.

To Give Glossy Surface to Plaster Casts.—In four ounces of ether, mix two ounces of collodion and two ounces of "silon gloss" (from dealers in painters' supplies). Let it stand for forty-eight hours, shake well before using, and keep in well-corked bottle. Apply with camel's-hair brush.—I. F. STEELE, *Amer. Journal*.

Identification by the Shape of the Palate.—Dr. Paul Prager, an Austrian army surgeon, who has made a special study of methods of identification, recommends that prisoners should be identified by the shape of their palates. He thinks the system far more efficacious than by finger-prints. Dr. Prager declares that the method would be much more reliable than any used at present, for among the thousands of casts he has made of the interior of the human mouth, he has failed to find two which even slightly resemble each other. He says that though the teeth alter greatly with time, the markings of the palate remain unchanged throughout life. The individuality of the palate is greater and more permanent than that of any other part of the body, and a detective force which possessed a large collection of casts of mouths would have a guide infinitely safer than a gallery of finger-prints.—*British Dental Journal*.

Preparation of the Mouth for an Impression: Extraction.—After consultation with a number of successful prosthodontists, and upon reviewing his own clinical experience, the writer has formulated the following general rules for extraction, as a preparation for taking an impression of the upper jaw: (a) If not more than three scattered teeth remain, extract them. (b) If two molars or bicuspid remain on each side, do not extract. (c) If only the incisors remain extract. (d) If four or five teeth remain on one side of the jaw and none on the opposite side, extract.

It will be understood that in a set of general rules exceptions will sometimes be necessary. For instance, if an unusually firm

molar or bicuspid remains on each side of the jaw, it might be advisable in some instances to let it remain. If it is feared that the removal of the canines will cause too great a change of facial expression, it is better to cut the crowns off at the gum line, and make the plate over the roots, than to attempt to fit the plate around them. Should four or five teeth remain on one side, a plate might be made that in some cases would serve esthetic purposes, though it might be useless in mastication.

To put it in broad general terms, when the remaining teeth in the maxilla are too few and too weak to support bridge work, they are also too few and too weak to be of material assistance in supporting a plate. They are retained for only a short time at the most, and both patient and operator are better satisfied when a full upper plate is fitted.—F. G. WORTHLEY, *Western Dental Journal*.

Impression for Gold Inlay.—Let us suppose that we have an approximal cavity in a bicuspid, and a molar is adjoining it. I take an impression by bending a piece of metal at right angles, and in that I place a low-heat modeling composition. I press it to place and get an overflow. I then take it out of the cavity, chill it with ice-water, trim away the overflow, leaving one thirty-second of an inch that is not in contact with the margin, and place it in the cavity again. It will go in like an inlay. I now place a wedge in approximally, and with pressure on the grinding surface, drop warm water on very slowly until it yields under pressure; then reset it. After chilling it and taking it out, I have an impression which is as accurate as an inlay should be, with no element of uncertainty as to whether the margins have been distorted or not.—W. H. TAGGART, *Dental Review*.

Wedging Preparatory to the Extraction of an Impacted Lower Third Molar Lying Against the Second Molar: A Case from Practice.—Last fall Mr. W— presented himself for treatment. Examination disclosed an impacted lower left third molar. The surrounding tissues were in a badly inflamed condition and there was a great deal of pain. Efforts to extract the tooth seemed to endanger the life of the second molar, besides causing almost unendurable suffering. The patient could open his mouth but slightly, and, all things considered, I did not think an anesthetic advisable, so I proposed wedging the third molar distally until it

should be released from contact with the second molar. This I did, using wooden wedges at first, and later a thick rubber wedge. During this process of moving the third molar, an abscess—whose seat was directly beneath the impacted tooth—was drained, and the soreness almost all disappeared. The wedges were changed every day, and on the sixth day there was sufficient space to admit of a comparatively easy extraction; with the aid of a small quantity of a local anesthetic, it was almost a painless operation.

Examination of the tooth after extraction disclosed the cause of the inflammation to be a large accumulation of granular calculi—similar to the barnacles found upon ships' bottoms—deposited upon that part of the tooth which was buried deepest in the gum.—A. W. BEACH, *Northwestern Dental Journal*.

Therapeutics of Pyorrhea Alveolaris.—In all cases of deep pockets, difficult of access, I simplify the work by previously packing the pocket with gauze saturated in 25 per cent. phenol-sulfonic acid, or aromatic sulfuric acid, which will often do quite as well. The packing should be left for twenty-four hours, when the gum will be crowded away from the tooth-neck where the pocket is, in order to enable you to see to a great extent exactly what you are doing, and to scale the root without much pain or laceration of tissue. The phenol-sulfonic acid has a tendency to soften calculi, thus making their removal much easier. For the purpose of reducing the pain incident to scaling, I recommend packing the pocket with a rope of cotton saturated in a 1 per cent. cocain-adrenalin solution, allowing it to remain in place for five minutes. Care should be exercised to pack absorbent cotton around the tooth to keep it dry and also to absorb any excess of the anesthetic that might otherwise be swallowed. I secure much better results by using an anesthetic in this manner than by using it hypodermically.—ELGIN MAWHINNEY, *American Dental Journal*.

Method of Making Impressions for Full Dentures by the Use of Modeling Compound and Plaster.—For full upper impressions, first select a cup that approximately fits the arch. Reaching back over the condyles use soft modeling composition, enough to reach as high as you wish, but not an excess such as would disturb the disposition of the tissues.

Secure a preliminary impression of the mouth, and from this make a preliminary cast. Mix the plaster thick, use a little po-

tassium sulfate, and run the cast. In a few minutes the cast will be hard enough to use. Now select a tray that will require the least cutting; use a horn mallet or merely by bending it shape the tray so that the least amount of modeling composition will be required to reach the proposed outline of the plate. Leave a little space between the posterior edge of the tray and the roof of the arch. Having the cup properly shaped, place into it some soft modeling composition, and then soapstone your temporary cast, and take an impression of the same, forcing out and trimming off the excess of modeling composition. Remove the cast. You will now have the accurate amount of modeling composition required for the impression.

Now comes the most important part of this work. Put the impression in water hot enough to soften the composition, place the tray in the mouth carefully and square on the arch, hold it firmly in position, and have the patient open the mouth and draw down the lip, so that the muscles and frenum will mark the height below which they will tolerate the plate. As soon as the composition begins to set, with your forefinger reach back to the heel of the tray and press the composition against the posterior arch, also around the condyles and rim in the canine region above the tray. After the modeling composition sets, remove and chill it.

Now mix up some quick-setting plaster, using a little potassium sulfate, to the consistency of thick cream. Pour it into the impression, covering the whole surface, and sling out all but just a coating; quickly replace it in the mouth, and when the plaster has set you will have the best fitting impression it is possible for one to get. Too much plaster in the last effort will spoil the impression. For lower impressions proceed as above, pressing modeling composition well against the inner side of condyles.—S. D. POTTER, *Dental Summary*.

Cast Gold Inlays and Tips.—We will suppose that a matrix, preferably of platinum, has been fitted to a properly prepared cavity for an inlay. If there is a fold or two about the margins and a few holes in the bottom of the matrix, it will not matter, provided that the holes do not extend to the margin at any point and the folds are well burnished. Of course the closer the fit of the matrix the better for any inlay. Fill the matrix with cold beeswax, pressing it in so as to force the platinum to the best adaptation possible to the cavity walls and margins. Use a slight surplus of wax, and have the patient bite into it if desired to get the articulation. Chill the

wax thoroughly. Remove by inserting a small piece of wire in the wax at the most convenient point. Trim the wax to the exact shape required, seal the margins to the matrix with a warm instrument, and try it in again. If it is of the desired form, remove it as before, and coat the underside of the matrix with sufficient investment material to support it, and allow it to harden. Now take more investment material and build up around the matrix and wax, leaving a small, cone-shaped cavity down to the wax at its highest point. Leave sufficient wax exposed to form a fair-sized opening when the wax is removed.

When the second investment has hardened, trim to a convenient size and shape and burn out the wax. If a platinum matrix has been used, place pure gold in the cone-shaped depression and heat carefully from below, either in the electric furnace or with a blowpipe. The gold will readily flow over the platinum. More gold may be added, if necessary, after that first placed has fused. The result will be a perfectly-fitting inlay that will need but little polishing. If a bit of the investment material should drop into the matrix and cause a pit where it would be objectionable,

the same can be readily repaired by sweating pure gold into the pit with a blowpipe. After the inlay is removed from the investment. If it is desired to use gold for a matrix, it can be done by using a lower karat for the body of the inlay. In that case a very small amount of flux should be used with the gold.

In making tips for anterior, or cusps for posterior teeth, this is a quick, easy, and accurate method. After the end of the tooth is prepared and holes have been drilled for the pins, burnish a piece of platinum of suitable size and form over the end of the tooth, and insert the pins through the platinum into the prepared holes, leaving the ends of the pins long enough to catch in the wax. Now contour with wax to the desired form, using stiff wax to force the matrix into perfect adaptation. Remove by inserting a wire into the wax, and invest as in the inlay case described above. The investment material will hold the pins in place in relation to the matrix so they will not have to be soldered. Burn out the wax and flow gold into the cavity, engaging the pins, and uniting all firmly to the matrix at the same time.—
F. M. FULKERSON, *Western Dental Journal*.

OBITUARY.

DR. J. BOND LITTIG.

DIED, suddenly, of angina pectoris, at his residence in New York city, on May 24, 1907, J. BOND LITTIG, D.D.S., in his sixty-eighth year.

Dr. Littig was born May 6, 1840, in Baltimore county, Md., where his early years were spent, and where his bright, sunny disposition, the characteristic of his whole subsequent life, had its earliest development. His dental education was obtained at the Baltimore College of Dental Surgery, from which institution he was graduated in the class of 1861, after which he went to New York, entering upon practice in that city about January 1, 1862, from which date he was an active participant in the dental life of the metropolis and contributed largely to its professional progress. He was at

various times associated with Dr. de Marini and Dr. Todd in a professional way, but after his marriage, May 23, 1871, to Miss Marion G. Downer of Dorchester, Mass., he fixed his residence in Seventeenth st., and became established in practice upon his own account. He removed later to Forty-seventh st., and finally to Seventieth st., where his family now resides.

Dr. Littig early connected himself in a teaching capacity with the New York College of Dental Surgery, at first as superintendent of the infirmary and demonstrator of mechanical dentistry. At the eighth annual session, in 1873-74, he was made adjunct professor of the institution. For the session of the following year his name does not appear in the college announcement, but at the session of 1875-76 he was clinical

of mechanical dentistry, and two later was elected to the chair of dentistry formerly filled by the late A. Marvin, whose death occurred December 15, 1906, and whose obituary notice in this issue.

Littig was a member of the Dental of the State of New York, the First Dental Society, the Odontological Society of New York, and of the National Dentition. In all of these organizations an active and interested worker, a thinker and debater, one in whom the instinct was highly developed, and the sequence his discussions were not only valued by their logical and judicial but were valued because of their interest.

Teacher he was at his best; his investment of mind led him to study his field with earnestness and thoroughness. Every new device or method received careful consideration, and his large experience and ripe judgment enabled him to rearrange his data and present them to his students in an interesting and clear way, which served to impress his strongly upon their minds.

Of his skill and training as a teacher and wonderful personality—wonderful in genial kindness, a quality which came from him upon all with whom he came in contact. It was this that attracted students to him, for he made them at that he was their friend;—and he was a friend. His friendship for young men, his helpfulness to them was not partiality, for it was universal. Who asked his help ever failed to receive it, and the help was forthcoming because a joy to him to be helpful. His regard for "his boys," and his relationship with them was almost that of a father. The spirit characterized his friendships. He was a fellow man, and no one who has experienced the touch of the friendship of Dr. Littig can ever forget its inspiration. A nobler view of life and a faith in the goodness of humanity. Unobtrusive, and earnest as his life, not until its active influence is lost can we realize in fullest measure the service he exerted for good among us. A circle of men will mourn the loss of a life of helpfulness and inspiration of

cheerfulness and good will; and all will remember with gratitude that J. Bond Littig lived, and that they knew and loved him.

E. C. K.

DR. C. A. MARVIN.

DIED, December 15, 1906, at the residence of his daughter, Mrs. R. G. Langdon, 186 Gates ave., Brooklyn, CORNELIUS ACKERSON MARVIN, from heart failure, in his eightieth year.

In the death of Dr. Marvin, after an illness of three weeks, there passes away one of the best-known dentists of "old Brooklyn," where he began the practice of his profession as long back as 1852. For many years his office was located on Clinton st., Brooklyn. He was a member of the Brooklyn Dental Association, the Brooklyn Dental Society, the Second District Dental Society, the New York Odontological Society, was elected a permanent member of the Dental Society of the State of New York in 1869, became vice-president in 1870, and president in 1873, and was elected an honorary member of the Dental Society of the State of New Jersey. He received his degree of D.D.S. from the Pennsylvania College of Dentistry in 1867, and was professor of mechanical dentistry in the New York College of Dentistry from 1873 to 1876.

Dr. Marvin prepared many papers for dental societies, which later appeared in the DENTAL COSMOS (from 1865) and the volumes of New York State Dental Society "Transactions." He was ready in debate and in the presentation of his own views. Many of his associates can remember the pleasure they derived when Drs. Hurd, A. H. Brockway, W. H. Atkinson, Jarvie, and Marvin participated in discussions, for they always had something of interest to say.

In 1872 Dr. Marvin removed with his family to Montclair, N. J., and became a member of the First Congregational Church, of which he was a trustee for twenty-five years. His pronounced republicanism also led to his writing many stirring letters to the *Montclair Times*. He was identified with the Republican Club as a member and officer. His social life in Montclair as a member of the Montclair Club and of the musical and dramatic societies and other interests, was al-

ways for the betterment of his associates. His vacations were spent in Sullivan county, until the death first of his son and then of his wife broke up the home. He then lived with one of his married daughters, but retired almost entirely from his former activities, so that his old friends lost sight of him, until the notice of his death reminded them of their loss.

In 1899 he gave up his Brooklyn office and for a year practiced in Montclair; then he went to live with his daughter, Mrs. J. Tenny, in Philadelphia, returning in the fall of 1906 to Brooklyn.

He was a thirty-third degree Mason and a past grand master, was a member of Altair Lodge No. 601 F. and A. M.; he formed and named Constellation Chapter of the Royal Arch, and was a member of the DeWitt Clinton Council, Knights Templar.

Dr. Marvin was an interesting and entertaining speaker, and Dr. Charles S. Stockton of Newark, N. J., a life-long friend of Dr. Marvin's, has recently recalled an incident descriptive of his oratorical accomplishments: Dr. Stockton says, "I remember very well when the American Dental Association met in Boston. It was most cordially received and welcomed by the dentists and by the city officials. Its members were taken around the harbor in a fine steamer, and a magnificent entertainment provided for them, at which time the mayor of the city, who was a remarkable orator, delivered an address of welcome. Dr. Marvin was selected on the spur of the moment to respond to the mayor's address, which he did in such a splendid manner as to elicit the hearty applause of all his hearers."

Dr. Marvin was popular with all his associates and did much to advance the interests of his profession, his church, and his political party. His advice and counsel were much sought, and his "helping hand" and voice were always at the service of those in need.

He is survived by three daughters—Mrs. E. A. Raynor of Bloomfield, N. J.; Mrs. J. Tenny of Philadelphia, and Mrs. R. G. Langdon of Brooklyn.

RESOLUTIONS OF REGRET.

Dr. George R. Leonard.

At a meeting of the North Dakota Dental Association, held May 13, 1907, the following resolutions were adopted:

Whereas, The hand of Providence has removed from our midst our honored member and active co-worker, Dr. George R. Leonard of Mandan; and

Whereas, In his decease we have suffered the loss of a member who had an active interest in this society, and who had the welfare of the entire profession at heart; therefore be it

RESOLVED, That we, the members of the North Dakota Dental Association, in session in Fargo this 13th day of May, 1907, express to the members of his bereaved family our sympathy and sorrow in their affliction, and assure them of our admiration for his high personal and professional qualities; and be it further

RESOLVED, That these resolutions be spread upon the records of this association, a copy sent to the family of our departed member, and copies sent to the dental journals for publication.

J. L. GRAVES,

A. M. HARDAWAY,

R. J. WASHBURN,

Committee.

Dr. L. L. Lester.

THE Southern Wisconsin Dental Association passed May 23, 1907, the following resolutions of respect to the memory of Dr. L. L. Lester:

RESOLVED, That in his death this association has lost an efficient member, and an esteemed worker for the promotion of dental standards and education.

RESOLVED, That we extend to his family our sincere sympathy, and assure them of our admiration for his high personal and professional qualities; and be it further

RESOLVED, That these resolutions be spread upon the records of the association, and a copy be sent to the family of our departed member, and copies sent to the dental journals for publication.

G. C. MARLOW, *President.*

C. W. COLLIER, *Sec'y.*

DENTAL COLLEGE COMMENCEMENTS.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

THE annual commencement exercises of the Royal College of Dental Surgeons were held in Toronto, Ont., Friday, April 26, 1907.

An address to the graduates was delivered by Prof. N. W. Hoyles, K.C., LL.D.

The degree of Licentiate of Dental Surgery was conferred on the following graduates:

Wm. Alex Black	Robert Milton Graham	Leslie Aikins Maxwell
Basil E. Brownlee	John Thomas Grassie	Alex. William Muir
Rich. Morris Chambers	Kenneth Irvine Halnan	Robert James Mumford
Jos. Clarence Crawford	Arthur Hamilton Hertel	Arthur Ed. Proctor
Edgar Allan Dolson	George Noble Howden	Ernest Fulton Risdon
David Henry Dow	Ashley W. Lindsay	Wm. John Sanders
James Arthur Drummond	Fred. Joseph McMahon	Willmott Benson Steed
Horace Fawcett Goodfellow	Vivian Clifford Marshall	Fred. Edgar Warriner

BALTIMORE MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE twenty-sixth annual commencement exercises of the Dental Department of Baltimore Medical College were held in the Academy of Music, Baltimore, Md., May 21, 1907.

The degree of Doctor of Dental Surgery was conferred by Prof. Chas. G. Hill on the following graduates:

Felix Patrick Davis	Georgia	Thomas Ambrose O'Brien..	Connecticut
Harry Arthur Donohue	Vermont	Roy M. Patterson	New York
Lucius E. Dreher	South Carolina	John Joseph Powers	New Jersey
Max Greenberg	New York	Henry Hutchins Ring	New Hampshire
Maurice Wallace Haag	Pennsylvania	J. Fuller Robinson	Virginia
Alonzo Garcelon Hooper	Maine	Samuel Irwin Salzman.....	Maryland
Harry Archibald Hoatling....	New York	Cleet M. Talbot	West Virginia
Clinton Powell Johnson	Maryland	George M. Whitney	New York
Frank Albert Lena	Massachusetts	Nathan P. Yolken	Maryland
Thomas Walter McGee.....	Massachusetts	Warren Zubrick	New York

UNIVERSITY COLLEGE OF MEDICINE, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the University College of Medicine, Department of Dentistry, were held Tuesday evening, May 21, 1907, in the New Academy of Music, Richmond, Va.

An address was delivered by the Hon. Robert T. Barton.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Thomas M. Armistead	Virginia	Harry Morton Quisenberry	Virginia
Charley Henry Chapman	West Virginia	A. F. DaCosta Ramos	Brazil
Randolph Tucker Creasy ..	Virginia	Hugh Greenway Russell	Virginia
Arthur Harris Johnson	North Carolina	James Alonzo Semones	Virginia

UNIVERSITY OF BUFFALO, DEPARTMENT OF DENTISTRY.

THE fifteenth annual commencement exercises of the University of Buffalo, Department of Dentistry, were held in the Teck Theater, Buffalo, N. Y., Friday, May 31, 1907.

An address was delivered by Jeremiah W. Jenks, A.M., Ph.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

John L. Egbert Banks	Ralph Dean Harby	Charles Merlin Miller
Reuel R. H. Barker	Frank Pierce Hill, Jr.	William Howard Moyer
Francis Edward Brauza	John Edward Hubbard	Alfred Prefert
Garfield Henry Bretsch	Guy Morris Hughey	Elmer Ernst Purington
Benjamin Franklin Clark	Roy Arthur Johnson	Roy Bennett Robbins
James Henry Colborne	John Bernard Kelly	Frank Austin Robinson
J. Welden Cramer	Alanson Gaius King	Stanley Eustace Ruszaj
James Graham Dunn	William King	Lester Ernest Sumeriski
Carl Harrison Fellows	Arthur Richard Lahey	Leonard Theodore Walsh
Lewis Roswell Ford	Edward Philip John McCormack	Franklin Charles Weaver
William Gillick	Dennis F. McRedmond	Maurice Stephen Williams
Walter V. Girvin	Howard Edward Marshall	Fred Ernest Youngs

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE fifty-first annual commencement exercises of the Pennsylvania College of Dental Surgery were held June 1, 1907, in the Broad Street Theater, Philadelphia, Pa.

An address to the graduates was delivered by Prof. Geo. W. Warren.

The degree of Doctor of Dental Surgery was conferred by I. Minis Hays, M.D. on the following graduates:

S. Louis Baron	Pennsylvania	Robert Greenberg	New York
Paul Fitch Beam	New Jersey	Lasar Gribeschock	Livonia
Maurice Edward Bessley	New Jersey	Eugene Schenck Griggs	New Jersey
Howard Merritt Berger	Pennsylvania	Harry M. Hoffman	Pennsylvania
Geo. Franklin Bonnick	Pennsylvania	Frederick L. Knox	Pennsylvania
Israel Borkin	New York	George Gerson Krall	Connecticut
Arthur Peter Brown	Pennsylvania	Benzion Simon Krisher	Pennsylvania
George Heaselgrave Caddick	New York	Arnold Le Witter	New York
Arthur Bastian Carey	New York	Abraham Beiners Lourie	Russia
George C. Cobler	Pennsylvania	Wilbur Pencoast Luffbary	New Jersey
John James Connolly	Pennsylvania	George Patrick McCall	Pennsylvania
Ernest Cummings	Connecticut	Mott Vedder Marcellus	New Jersey
Max Davis	Pennsylvania	Philip E. Mellen	Vermont
Louis Dezsi	Hungary	Louis Michael	Pennsylvania
Florence Dingman	New York	Vernon Grandville Morrow	Massachusetts
Francis David Dolan	Connecticut	Louis Mosquitz	Pennsylvania
John Aloysius Dougherty	Pennsylvania	William Spellman Novak	Vermont
James Joseph Durkin	Rhode Island	Alexander J. Perlove	Pennsylvania
Francis Stephen Dwyer	Connecticut	Morris Rosenblum	New York
Matthew Cumer Farrell	Nebraska	Eduardo y Rangel Ros	Cuba
Julio Feraldo	Peru	W. Edgar Rourke	Pennsylvania
Evangeline Fetter	Missouri	J. Morris Smith	Pennsylvania
Michael Aloysius Fitz-Gerald	New York	Henry R. Sternthal	Pennsylvania
Abraham Edward Fischman	New Jersey	Charles Ross Stowe	New York
Samuel Fleischmann	New Jersey	Charles Sufrin	New York
John Francis Folz	New Jersey	Thomas J. Thomas	Wales
Augustine Alphonsus Gill	Pennsylvania	Albert Wilbur Traband	Connecticut
Meyer D. Goldberg	Pennsylvania	Walter Allison Tracy	New Jersey
Samuel Joseph Goldberg	Pennsylvania	Wilbur Sanford Weeks	Connecticut
Harry Golden	Pennsylvania	James Norman Winner	Delaware

UNIVERSITY OF PENNSYLVANIA, DENTAL DEPARTMENT.

THE one hundred and fifty-first annual commencement exercises of the University of Pennsylvania were held at the American Academy of Music, Philadelphia, Pa., June 19, 1907.

An oration was delivered by the Hon. John A. Johnson, governor of Minnesota. The degree of Doctor of Dental Surgery was conferred on the following graduates:

John Joseph Armitage	England	John Lynch McAteer	New Jersey
René Elie Louis Audry	France	Francis Lenes McCormick	New York
Frank Philip K. Barker	Pennsylvania	John Acquin McKone	Connecticut
Emanuel William Bauman ..	New York	Hobart Philo McPherson ..	New York
James Le Roy Baxter	New Jersey	Alfred Fyvie Marr	Australia
Reginald Black	Australia	Robert Frank Merriam ..	Massachusetts
Calvin Fredricke Bonawitz ..	Pennsylvania	Curt Carl Alphons Michel ..	Germany
Harold Henry Bond	Australia	Preston Emmet Miller ..	Illinois
Eli Bortin	Pennsylvania	Eli Frank Millett	Massachusetts
David Brewster	Ireland	Leslie Merlin Molineaux ..	New Zealand
Timothy Andrew Buckley ..	Illinois	Harry Thomas Moreland ..	Delaware
George Albertus Burdick ..	New York	Armando Moreno	Chile
Cole Oliver Burt	Vermont	Fred Taylor Newman	New York
Hans Hjalmar Conradsen ..	Denmark	Frank Villeneuve Nicholson ..	Australia
Thomas Sylvester Cooney ...	New York	Frederick William Nuffort ..	New Jersey
Wilfred Francis Cooper	England	Clarence Merrill Oliver ..	Massachusetts
Alfred Paul Davison	Pennsylvania	John Sadler Owens	New Jersey
William Alfonse Dessingue ...	New York	Dezső Papp	Hungary
Isaac Caleb Detweiler	Pennsylvania	Ralph Snellgrove Parker ..	Australia
Arthur Hall Dillon	New York	Robert Marius Parker	Pennsylvania
Thomas Augustine Dillon ...	Massachusetts	Frank Walsworth Peeso ...	Pennsylvania
Ignatius Joseph Donnelly ...	Canada	Michael Peyser	New York
Albert Thurman Dooley	Massachusetts	João Ferreira Pires	Portugal
Walter John Dwyer	Massachusetts	Hugh Templeton Porteous ..	New Zealand
James Carroll Entriken	Pennsylvania	Eligio Federico Ros	Porto Rico
John Jeremiah Ervin	New York	Leonardo Ros	Cuba
Edward Sell Filbert	Pennsylvania	William Henry Schaeffer ..	Pennsylvania
Edward Richard Flatley	Pennsylvania	Le Roy Lucien Scott	Pennsylvania
George Melville Flint	Pennsylvania	Eugene Senior	British West Ind.
James Joseph Galligan	Pennsylvania	Alfred Cole Shaddock	New York
Matthew Manasseh Goldman ..	New Jersey	Arturo Sierra Mendoza ...	Chile
Clarence LeRoy Gowen	Connecticut	Daniel Richmond Singleton ..	New York
Clarence Breneiser Grim	Pennsylvania	Victor Clyde Smedley	Colorado
Norman St. Clair Hales	New Zealand	Francis Hemsath Solomon ..	Pennsylvania
Ralph Gookin Hammond	New York	Newman Elgean Sprague ...	New York
Charles Raymond Herrington ..	Pennsylvania	Emil Staehelin	Switzerland
Charles Arlington Hodder ...	New York	Norman Young Stewart	Ireland
Bertram Mitchell Hunter	Scotland	George Amos Stowe	Kentucky
Herbert Humphreys Hunter ...	Australia	Maurice Raphael Sullivan ..	Connecticut
Lee Roy James	Illinois	Charles Paul Tacail	France
Charles Henri Jean	France	Howard James Thomas	New Jersey
George Forrester Kellogg ...	Rhode Island	Saul Georges Tubiana ...	France
Philip Kurtz	Pennsylvania	Maximilian Ulbrich	Austria
Raymond Lemiere	France	Henri Louis Villain	France
Fred Percy Lieberman	New Jersey	John Alvin Wagg	New Jersey
Henry Frederic Lombard	Massachusetts	George Frederick Watson ..	Ireland
John Burt Longwell	New York	Sloat Fassett Williams ...	Pennsylvania
William Asbury Lowndes	New York		

Degree conferred (as of the class of 1906) University Council, Friday December 14, 1906:

Harry Barnett
George Johnston Davies,

Charles Joseph Hart,
Walter Edwin Jones,

Lewis Cresse Leaming,
Ernest Wester.

COLLEGE OF ORAL AND DENTAL SURGERY OF NEW YORK.

THE annual commencement exercises of the College of Oral and Dental Surgery were held in Mendelssohn Hall, New York city, May 27, 1907.

An address to the graduates was delivered by Rev. Chas. Townsend, D.D.

The degree of Doctor of Dental Surgery was conferred by Mr. Clarkson Cowl, president of the board of trustees, on the following graduates:

Deborah Benzionovna Block	.....Russia	George Edward Marshall	....Canada
Michael Mitchell Bonsole	.....New York	Elizabeth Samuel Maruchess	..New York
Henry Born	.....Germany	Max Moore	.....Hungary
Jacob Burger	.....Hungary	Samuel Morris	.....New York
Aaron John Cohen	.....New York	Dora Neveloff	.....New York
Samuel Michael Deitz	.....New York	Anna Pavitt	.....Russia
George Bradley Ellor	.....New Jersey	Frederick Elliott Pierce	....Massachusetts
Samuel Fine	.....New York	Auguste Pottier	.....France
Joseph E. E. Fishman	.....New York	Nathan Asher Rachliss	....Roumania
Eugene Solomon Greenberg	....New York	Thomas Walter Robinson	....Georgia
Bella Lillian Halpern	.....New York	Herman Carl Rudolph	.....Germany
Ottillie Hornik	.....Austria	Esther Sachs	.....New York
Jacob Husch	.....Germany	Benjamin Schwartz	.....New York
Frank Sumner Hutchinson	....New York	Gothard Edmund Seyfarth	....Wisconsin
Lazare Jacob	.....Roumania	William Shapero	.....New York
Henry Anthony Kaemmerer	....New York	Alice Elliot Sindey	.....New York
Franklin Parker Luckey	.....New Jersey	Samuel Stecher	.....Austria
James Bernard McGrath	.....Vermont	Julius Toff	.....Holland
John Joseph McGrath	.....Vermont	Ernest William Toshack	....Iowa
Robert Hammond McLeod	.....Connecticut	David Wurzel	.....New York

NEW YORK COLLEGE OF DENTISTRY.

THE forty-first annual commencement exercises of the New York College of Dentistry were held in Carnegie Hall, New York city, Monday, June 3, 1907.

An address to the graduates was delivered by Rev. Lindsay Parker, Ph.D., and the valedictorian was Arthur Lambert Cone, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Rev. George Alexander, D.D., on the following graduates:

Albert Rutzen Allen	.....New Jersey	Samuel Gerber	.....New York
Joseph Morris Atchason	.....New Jersey	Bergen Woolsey Glover	.....New York
Israel Abraham Backal	.....New York	Nathan Gold	.....New York
Bernard Benedet Badanes	.....New York	Edward Graboff	.....New York
Alfred Max Otto Oscar Bartel	....New York	Walter Michael Guensch	.....New York
Thomas Joseph Bartley	.....New York	George Luke Havell	.....New Jersey
Maximilian Berall	.....New York	Samuel Mallory Hinman	.....New Jersey
Isidor Berger	.....New York	Edward Mortimer Hochdorf	....New York
Elias Bier	.....New York	Harry Hollander	.....New York
Edward Ardashes Bishop	.....New York	Archibald Aaron Jacobs	.....New York
Le Roy Mount Bleyer	.....New York	Samuel Isaac Kalish	.....New York
Emanuel Brand	.....New York	Abraham Abbot Kauffman	....New York
Abraham Naum Bresler	.....New York	Charles Kriegel	.....New York
Walter Titus Carpenter	.....New York	Adolph Lappner	.....New York
Samuel Cohen	.....New York	Louis Jonas Lautman	.....New York
Arthur Lambert Cone	.....New York	Louis Leon Lazarnick	.....New York
James Brodie Davidson	.....New York	Charles Harold Leibowich	....New York
Jacob David Davis	.....New York	Isidor Leibowitz	.....New York
Morris Bernard Dimin	.....New York	Isidor Levy	.....New York
Louis Eliasberg	.....New York	Isaac Lipnitzsky	.....New York
Abraham Louis Feldman	....New York	Abraham Paul Loesberg	....New York
Julius Filler	.....New York	Louis Loewinger	.....New York
Max Friedman	.....New York	David Ludwig	.....New York

David Julius Machol	New York	Harry Shapiro	New York
Arthur Warren Mac Vey	New York	Samuel Israel Sherman	New York
James Welch Maddren	New York	Isadore Silverman	New York
David Marks	New York	Solomon Silverman	New York
Samuel Alfred Massell	New York	Charles Louis Singer	New York
Samuel George Michlin	New York	Herbert Fearn Smith	New York
Robert Morrow	New York	Percival Simon Sprinz	New Jersey
William Henry Morse, Jr.	New York	Charles Plater Turner	New York
Mendel Nevin	New York	Roy Eldridge Tuthill	New York
Julius Pensak	New York	Max Harry Uberman	New York
Abraham Pflantzer	New York	Wallace Trueman Van Winkle ..	New York
Leo Raphael Posner	New York	Joseph Louis Wasserman	New York
Nicholas Rabinoff	New York	Abraham Harry Weisberger ..	New York
Harry Edward Ramsey	New York	Adolph Wellward	New York
Isador Harry Rogow	New Jersey	Frank William Werner	New York
Henry George Sachter	New York	Maurice William	New York
Otto Sarchy	New York	William Wolfer	New York
Herman Schlesinger	New York	Abraham Wolfson	New York
Joachim Herman Schwerdtfeger ..	New York	David Zimmerman	New York
Peter Segal	New York	Reuben Zuckerman	New York
Samuel Seidman	New York		

MEDICO-CHIRURGICAL COLLEGE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Medico-Chirurgical College, Dental Department, were held at the Academy of Music, Philadelphia, Pa., May 31, 1907.

The doctorate oration was delivered by Dr. John A. Witherspoon.

The degree of Doctor of Dental Surgery was conferred by the Hon. Henry F. Walton on the following graduates:

George Oliver Barclay	Pennsylvania	Isadore David Magill	Pennsylvania
John Hartman Beckley	Pennsylvania	Walderman A. Muller	New York
Francis J. Cusack	Pennsylvania	George Ruby	Pennsylvania
James B. Davenport	Pennsylvania	John Roscoe Smith	Pennsylvania
George S. Dilmore	New Jersey	Milton Oliver Trexler	Pennsylvania
Robert Henry Flynn	Rhode Island	Harry Maxwell Walters	Pennsylvania
Arthur Merlyn Gates	Pennsylvania	Douglas Webster	New Jersey
William H. Keyser, Jr.	Pennsylvania	George William Wilkens	New Jersey
Ralph George Kistler	Pennsylvania	Jancu Zaharia	New York
Lewis J. Kleeman	Pennsylvania		

PITTSBURG DENTAL COLLEGE.

THE commencement exercises of the Pittsburg Dental College were held June 7, 1907, in the Carnegie Music Hall, Pittsburg, Pa.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Alvin Curtis Amos	Williard C. Craighead	Andrew M. Martin
Winfred Foster Banbury	Wilbur Edwin DuVall	Harry Browne Miller
Aron Reimer Baxter	William Adolph Hollstein	Clyde Mamlin Neill
Carl William Blumenschein	David Pomerene Husler	Charles Adam Reith
Adolph Abraham Blumenthal	DeWitt Pritchard Hutchinson	Alvin DeWitt Rhodes
Charles Henry Boisseau	Herbert Augustus Kelly	Walter Ritchie
Walter Francis Burgeon	Albert Frederick Leonhard	Edward McCreedy Robison
Charles Voyle Butler	William E. Lewis	Stanley Snyder Schlag
Clyde Sparks Campbell	Alexander Newton Lurting, Jr.	Leslie Waddill

WASHINGTON UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Washington University, Dental Department, were held in Memorial Hall, St. Louis, Mo., May 21, 1907.

An address was delivered by Needham C. Collier, A.B., A.M., LL.D.

The degree of Doctor of Dental Surgery was conferred by Chancellor Winfield S. Chaplin on the following graduates:

Samuel Thompson Adams	Missouri	Herbert William Patterson	Illinois
Homer George Baird	Illinois	William Ennis Peak	Illinois
Henry Brison Bolt	Arkansas	James Orville Rice	Illinois
George Martin Byrne	Nebraska	Frank Roberts	Oregon
Edgar Mason Carson	Missouri	Wendelin Marion Schindler	Missouri
Earle Malcom Conner	West Virginia	Paul William Schroeder	Missouri
Konrad Eggemann	Switzerland	Max Heinrich Adolph Schmid	Switzerland
Michael Joseph Gessel	Missouri	William Rector Smith	Missouri
Anthony John Grodzki	Missouri	Irvin Marcus Sternberg	Arkansas
Robert Norris Holloway	Texas	Jett Heagle Sunderland	Illinois
Walter Lucius Hunt	Missouri	George Paul Tellmann	Missouri
Claude White Johnson	Missouri	Frederick Edgar Thornburgh	Missouri
John Dawson Jordan	Arkansas	Arthur LaVega Tice	Missouri
Albert Arthur Kalbfleisch	Missouri	James Vincent Wavrin	Iowa
Edgar Hayden Keys	Pennsylvania	Charles Edward Wieser	Missouri
John Cadesman Logan	Arkansas	Edwin Christian Will	Missouri
Earl Jesse Logue	Iowa	Meade Ellis Winters	Illinois
Henry Olen Neville	Missouri	Henry Zanitsch	Missouri

CREIGHTON UNIVERSITY.

THE annual commencement exercises of Creighton University were held in Omaha, Neb., Thursday, May 30, 1907.

An address to the graduates was delivered by Rev. M. P. Dowling.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

H. A. Adams	L. A. Chamberlin	G. W. Henton	F. N. Ralston	J. K. Sewell
H. E. Bartle	R. O. Demay	J. M. Jackson	E. H. Reeves	H. E. Snyder
C. L. Bunten	G. J. Green	J. V. Jarrett	F. F. Reinert	Orin Stanfield
F. H. Burton	C. B. Hamilton	J. Kelley, Jr.	C. B. Robertson	E. E. Waite
F. D. Caldwell	C. Hanson	S. W. McCall	W. E. Schaff	J. E. Wallace
R. H. Cass				

NORTH PACIFIC DENTAL COLLEGE.

THE annual commencement exercises of the North Pacific Dental College were held in Portland, Ore., May 31, 1907.

An address to the graduates was delivered by Rev. Thomas E. Sherman, S.J.

The degree of Doctor of Dental Surgery was conferred by Otto S. Binswanger, Ph.D., M.D., on the following graduates:

Mary Catherine Adams	Walter Clare Ketchum	Thomas Kemp Sanderson
Walter Raleigh Bilyeu	David Trainer Kerr	Lee Garfield Schell
David Sylvanus Bomgardner	Wright Bret Lee	James Edwin Sharp
William Ora Boon	Robert Patton Nixon	William Augustus Short
Harry Parmer Borders	David Marion Ogden	Lester Peter Sorensen
Augustus Dolph Dahlman	Frank Hobart O'Neil	Ernest Edwin Starr
Ralph Emerson Duganne	Sidney Desmoines Partch	Lewis Sanford Stejer
Ray Eudell Farnsworth	Ralph Ray Penepacker	John Swanberg
Walter Dorsey Huntington	William E. Pittenger	Jess Rogers Tidball
Ralph Levis Jeffcott	Edward Ringhoffer	Gibson Towne White
Trevelyn Albert Jones		

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: July, August, and September, 1907.

JULY.

INTERSTATE DENTAL FRATERNITY. Minneapolis. July 29th.

MAINE DENTAL SOCIETY. Rockland. Three days: July 16th to 18th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Minneapolis. Three days: July 26th to 29th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Minneapolis. July 26th.

NATIONAL DENTAL ASSOCIATION. Minneapolis. Four days: July 30th to August 2d.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 17th to 19th.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburg. Three days: July 9th to 11th.

SOUTH CAROLINA STATE DENTAL ASSOCIATION. Anderson. Four days: July 2d to 5th.

TENNESSEE STATE DENTAL ASSOCIATION. Knoxville. Three days: July 8th to 10th.

AUGUST.

FIRST FRENCH CONGRESS OF STOMATOLOGY. Paris. Five days: August 1st to 5th.

INTERNATIONAL DENTAL FEDERATION. Amsterdam. Two days: August 8th and 9th.

SEPTEMBER.

JAMESTOWN DENTAL CONVENTION. Norfolk, Va. Three days: September 10th to 12th.

VIRGINIA STATE DENTAL ASSOCIATION. Norfolk. September 9th.

Examiners' Meetings.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS. Washington. July 1st to 3d.

MAINE BOARD OF EXAMINERS. Portland. July 8th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. July 9th to 11th.

VERMONT BOARD OF EXAMINERS. Montpelier. July 1st to 3d.

WYOMING BOARD OF EXAMINERS. Sheridan. July 1st to 3d.

PSI OMEGA FRATERNITY.

THE Grand Chapter of Psi Omega will meet at Minneapolis July 29 and 30, 1907. More definite information may be had of

Dr. E. H. STING, *Supreme Councilor*,
Tiffin, Ohio.

Members desiring accommodations during the meeting of the Pennsylvania State Dental Society at Pittsburg, July 9th, 10th, and 11th, please write

Dr. J. S. ASHBROOK,
Pittsburg Life bldg., Pittsburg, Pa.

INTERSTATE DENTAL FRATERNITY.

THE board of governors of the Interstate Dental Fraternity will convene for the annual business meeting of the order in Minneapolis, Minn., Monday, July 29, 1907, at the West Hotel. The annual banquet will occur during the week, and due notice thereof will be sent to the members as soon as arrangements can be made and the exact date fixed. A large gathering of the fraternity is looked for.

R. M. SANGER, *National Sec'y*,
East Orange, N. J.

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompret, general secretary; Dr. Gires, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Address

DR. CHOMPRET, *General Sec'y*,
182 rue de Rivoli, Paris.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next meeting of the *Fédération Dentaire Internationale*, to be held at Amsterdam on August 8 and 9, 1907, promises to be one of exceptional interest, as a number of questions of great importance to the federation, as well as to the whole profession, must receive thorough consideration at that time.

Our experience has brought out a number of points in the rules and regulations which require to be cleared up. The question of a pamphlet containing specific directions for the care of the teeth, presented in a form adapted to widest circulation among the poor, is also to receive its final settlement at Amsterdam.

Particular attention will be devoted to a matter which after a period of comparative quiet is again agitating the minds of dental teachers and practitioners, and which concerns the education which in future should be demanded of the dentist. The question whether the dentist should above all things be a full graduate in medicine, with a knowledge, more or less complete, of dentistry superadded, or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make on him, is one which the F. D. I. has already pronounced upon in its session at Stockholm in August 1902. It cannot, however, be considered as having been definitely disposed of. It is, on the contrary, perhaps more acute at present than at any previous period in the history of our professional development.

The position of the F. D. I. having become more firmly established and its vote more authoritative, it is very desirable that its opinion should again be heard on this most important question, and every member should come prepared to give definite expression to his views.

Another point to be dealt with relates to the action of the committee of organization of the next international medical congress to be held in Budapest in 1909, in excluding from participation dentists who do not possess the medical degree. A consideration of the rights and duties of the F. D. I. in connec-

tion with the international dental congress to be held in Berlin in the same year will also take up some of the time.

These are a few of the matters which require special attention, and I sincerely hope that members will make every possible effort to be present. The steps taken toward the founding of an intellectual world-center at the Hague, if realized—and there seems to be every reason for trusting that such will be the case—will give an impulse to internationalism which will add greatly to the significance and importance of the F. D. I., and the hopes that it will be able to accomplish much in the interest of our profession and of humanity at large seem nearer fulfillment now than ever before.

W. D. MILLER, *President.*

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in Minneapolis, Minn., commencing at 2 P.M., Friday, July 26, 1907.

The Executive Committee will meet at 10 A.M. the same day. The West Hotel has been selected as headquarters and place of meeting. Hotel rates as published in the notices of the meeting of the National Association of Dental Examiners will prevail.

H. B. TILESTON, *Ch'man Ex. Committee,*
B. HOLLY SMITH, *Sec'y Ex. Committee,*
1007 Madison ave., Baltimore, Md.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will hold their twenty-fifth annual meeting in Minneapolis, Minn., beginning Friday, July 26th, and continuing through the 27th and 29th. A large attendance of delegates is earnestly requested.

Accommodations have been secured in the leading hotel of Minneapolis—The West Hotel. Rates will be as follows: Rooms without bath, \$1.00 per day for each occupant; with bath, \$2.00 per day for one person, and \$1.50 per day for each additional person in room. The hotel is run on the European plan. Any room in the hotel is capable of accommodating two people. All

the rooms have telephone connection, and hot and cold water.

The Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards' Reports, and the Committee for Promoting a System of Credits and Uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the association.

CHAS. A. MEEKER, *Sec'y-Treasurer*,
29 Fulton st., Newark, N. J.

NATIONAL DENTAL ASSOCIATION.

THE eleventh annual meeting of the National Dental Association will be held in Minneapolis, Minnesota, July 30 to August 2, 1907. In many ways this promises to be the most interesting and important meeting in the history of the association, and as it has been some years since a meeting of the National was held in this section of the country, it is confidently expected that the attendance will surpass that of any previous session.

The general sessions of the association will be held in the First Baptist Church, corner Tenth st. and Harmon Place, and it is proposed by the Program Committee, in consequence of a prevailing sentiment, that all papers be read so that the entire membership may have an opportunity to hear and discuss them. Only one section therefore will be in session at the same time.

There will be sufficient time allowed in carrying out the program so that each section will have two sessions of at least three hours' duration, which should be ample to complete the work.

Membership in the association is open only to delegates from state societies, yet a most cordial invitation is extended to all reputable practitioners to attend the meeting.

Reduced rates on all railways, except in Minnesota, on the certificate plan, of a round trip for a fare and a third, have been secured, full details of which will appear in the official announcement.

Hotel Plaza has been designated as headquarters for the association, while the Clinics and Dental Exhibit will be held at the First National Guard Armory on Sixteenth st. Hotels and rates are as follows: The Plaza,

\$2.00 per day and upward; European plan. The West, \$1.00 per day and upward; European plan. The Nicolett, \$1.00 per day and upward; European plan. The Majestic, \$1.00 per day and upward; European plan. For hotel reservations, etc., address the chairman of the local committee of arrangements, F. B. Kremer, Masonic Temple, Minneapolis, Minn.

Minneapolis and vicinity is one of the most interesting and beautiful sections of our country, and particularly so at this season of the year; and in addition to this, our local committee of arrangements is planning many features of interest for the entertainment and convenience of all. It is the earnest wish and expectation of the officers of the association that there shall be a large attendance at the meeting.

Organization.

The following are the officers of the sections and chairmen of clinics and local arrangements:

SECTION I:

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

D. O. M. LE CRON (chairman), Missouri Trust bldg., St. Louis, Mo.

W. G. MASON (vice-chairman), Tampa, Fla.

E. P. DAMESON (secretary), 58 De Menil bldg., St. Louis, Mo.

SECTION II:

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

WM. CRENSHAW (chairman), 621 Prudential bldg., Atlanta, Ga.

JOHN I. HAET (vice-chairman), 118 W. Fifty-sixth st., New York city.

J. J. SARRAZIN (secretary), Godchaux bldg., New Orleans, La.

SECTION III:

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR (chairman), 35 W. Forty-sixth st., New York city.

W. H. G. LOGAN (vice-chairman), 785 Winthrop ave., Chicago, Ill.

M. L. RHEIN (secretary), 38 E. Sixty-first st., New York city.

CLINICS.

E. K. WEDELSTAEDT (chairman), 204 New York Life bldg., St. Paul, Minn.

SECTION ON INLAYS.

WALTER N. MURRAY (chairman), 601 Medical blk., Minneapolis, Minn.

LOCAL COMMITTEE OF ARRANGEMENTS.

F. B. KREMER (chairman), Masonic Temple, Minneapolis, Minn.

Delegates received only from state societies, but a cordial invitation is extended to all reputable practitioners to attend the meeting.

C. S. BUTLER, *Sec'y*,
267 Elmwood ave., Buffalo, N. Y.

A. H. PECK, *President*,
92 State st., Chicago, Ill.

Section I.

PARTIAL PROGRAM.

The following papers have been secured so far:

"The Over-Arch-Bar in Bridge Work." By L. C. Bryan, Basel, Switzerland.

"Some Practical Experiences Theoretically Expressed." By Emory A. Bryant, Washington, D. C.

"Treatment of Malocclusions of the Deciduous Teeth." By Guilhermena P. Mendel, Minneapolis, Minn.

"Evolution." By Chas. L. Hungerford, Kansas City, Mo.

"The Effect of Excess of Mercury upon Shrinkage, Expansion, Edge Strength, Flow, Change in Composition, and Stability of the Dental Amalgam Alloys." By Marcus L. Ward, Detroit, Mich.

"Porcelain—the Cavity and the Matrix." By C. M. Work, Ottumwa, Iowa.

"Physical Condition of or Pertaining to the Human Teeth." By F. G. Corey, Council Grove, Kans.

"Method of Replacing Broken Facings on Crowns and Bridges." By J. V. Conzett, Dubuque, Iowa.

There will be a few additions to the list, as returns are not yet in.

D. O. M. LECRON, *Ch'man*,
E. P. DAMERON, *Sec'y*.

Section II.

PARTIAL PROGRAM.

"An Original Method of Casting Gold Inlays." [Illustrated with India ink drawings and models showing technique.] By Carroll H. Frink, Fernandina, Fla.

"Modern Methods of Combining Cohesive Gold with Non-cohesive Gold, with Tin, and with Tin-Gold." By L. G. Noel, Nashville, Tenn.

"Physical Characteristics and Surgery of Pyorrhea." By Thomas B. Hartzell, Minneapolis, Minn.

"The Functions of the State Dental Society." By G. O. Orr, Jordan, Minn.

"Dental Literature." By Charles McManus, Hartford, Conn.

WM. CRENSHAW, *Ch'man*,
J. J. SARRAZIN, *Sec'y*.

Section III.

"Buccal Manifestations of Syphilis." By Victor C. Pederson, New York city.

"The Prevention of Disease of the Mouth and Teeth by Proper Oral Prophylaxis in the Young." By Herbert L. Wheeler, New York city.

"Anatomy of the Palate—Normal and Cleft." By Truman W. Brophy, Chicago, Ill.

"Prophylaxis, with Special Reference to the Wisdom Teeth." By Joseph Head, Philadelphia, Pa.

"Dental and Oral Lesions of Leprosy." By Robert T. Oliver, U. S. A. Dental Corps.

"Mouth-infection the Cause of Systemic Disease." By Arthur H. Merritt, New York.

WM. CARE, *Ch'man*,
M. L. RHEIN, *Sec'y*.

Clinic Section.

DISTRICT AND STATE CHAIRMEN.

New England States. Dr. G. E. Savage, Worcester, Mass.

New York. Dr. F. L. Fossum, N. Y.

New Jersey, Delaware, and District of Columbia. Dr. M. F. Finley, Washington, D. C.

Maryland. Dr. C. M. Gingrich, Baltimore, Md.

Virginia and West Virginia. Dr. F. W. Stiff, Richmond, Va.

North and South Carolina and Georgia. Dr. H. H. Johnson, Macon, Ga.

Florida, Alabama, and Mississippi. Dr. A. T. Reeves, Selma, Ala.

Tennessee and Kentucky. Dr. W. M. Slack, Memphis, Tenn.

Pennsylvania. Dr. H. E. Friesell, Pittsburgh.

Ohio. Dr. H. C. Brown, Columbus.

Indiana. Dr. C. D. Lucas, Indianapolis.

Illinois. Dr. F. W. Gethro, Chicago.

Wisconsin. Dr. S. H. Chase, Madison.

Ontario.

Manitoba. Dr. K. C. Campbell, Winnipeg.

I regret to say that I have heard from very few of the state chairmen, therefore it is not possible to give the program in detail.

The headquarters in Minneapolis will be the Plaza Hotel. The clinics will be held in the Armory, one-half block from the hotel.

The clinic will be the largest the National has ever held. There will be sixty-five practical operations on Wednesday July 31st, and the same number of operations on Thursday August 1st. About forty of these one hundred and thirty operations will be the making and placing of inlays. The remainder of the operations will be divided into gold, amalgam, tin, cement, and gold-and-tin fillings, the removal of calculus, the administration of local anesthetics, etc. There is every evidence at hand that there will be the usual large number of men holding table clinics. Until the various chairmen make their reports I am unable to complete the program. On Thursday, June 20th, the program will go to the printer. It will be impossible thereafter to place names upon it.

Dr. W. N. Murray of Minneapolis will have charge of the inlay section. Dr. F. S. Yeager of St. Paul will have charge of the table clinics. Dr. W. A. Gréy of St. Paul will have charge of the surgical clinics, of which there will be a number. All of these men will appoint their own corps of assistants.

Drs. Carlson, Cox, Wells, Wilson, and myself will be in the clinic room, and we shall do everything possible to assist the operators.

After considerable persuasion, Dr. J. B. Ridout of St. Paul has agreed to give a blow-pipe demonstration. It is well worth making a trip from New York to Minneapolis to wit-

ness this clinic. I am able to unhesitatingly indorse the demonstration which Dr. Ridout will give, for I feel that it will be one of the most interesting and attractive of all the table clinics.

Dr. Bryan and Dr. Müller of Switzerland are journeying to the meeting with some things in the mechanical line which they feel are of the greatest value for everybody to see.

These are simply special features.

I said there would be one hundred and thirty practical demonstrations in Minneapolis on the two days of the clinic. I speak in this way for the reason that the men belonging to the metal filling clubs in the Northwest have requested to be allowed to fill any and all vacancies which might occur. This action on their part is not only most laudable, but it at once assures those who will attend the meeting of witnessing the largest operative clinic ever arranged for the consideration of the members of the N. D. A.

I return sincere thanks to all who have been willing to work and who have assisted Dr. Clack and myself to arrange the best clinic possible.

I also wish to return many thanks to the editors of the different dental journals for their assistance and co-operation.

My program at present contains the names of the following gentlemen who will make operations:

PARTIAL PROGRAM.

Surgical Clinic.

W. H. C. Logan, Chicago, Ill.

L. F. Luckie, Birmingham, Ala.

W. H. DeFord, Des Moines, Ia.

Inlay Section.

R. H. Volland, Iowa City, Iowa.

C. H. Farrand, LaCrosse, Wis.

F. H. Brimrose, Butte, Montana.

C. M. Work, Ottumwa, Iowa.

W. H. Cudworth, Milwaukee, Wis.

J. E. Meyers, Minneapolis, Minn.

W. C. Pike, Minneapolis, Minn.

T. W. Russell, Minneapolis, Minn.

A. E. Peck, Minneapolis, Minn.

F. B. Kremer, Minneapolis, Minn.

J. O. Wells, Minneapolis, Minn.

W. N. Murray, Minneapolis, Minn.

W. J. Brownlee, Devil's Lake, N. D.

J. Q. Byram, Indianapolis, Ind.

L. C. Elkins, St. Augustine, Fla.

C. A. Sevier, Jackson, Tenn.
 A. G. Fee, Superior, Wis.
 R. R. Fisk, Spokane, Wash.
 G. W. Schwartz, Chicago, Ill.
 J. D. Park, Duluth, Minn.
 A. A. Jennings, Milwaukee, Wis.
 G. J. Pattison, Fargo, N. D.
 P. B. McCullough, Philadelphia, Pa.
 C. G. Von Suessmilch, Duluth, Minn.
 A. T. Reeves, Selma, Ala.
 C. H. Seeger, Manitowoc, Wis.

Other Operations.

H. J. Beemer, Newton, N. J.
 J. J. Booth, Marion, Iowa.
 E. S. Brown, Edina, Mo.
 F. Bernard, Kennett Square, Pa.
 J. V. Conzett, Dubuque, Iowa.
 W. G. Crandall, Spencer, Iowa.
 Wm. Finn, Cedar Rapids, Iowa.
 J. W. S. Gallagher, Winona, Minn.
 C. L. Gunn, Gadsden, Ala.
 T. B. Hartzell, Minneapolis, Minn.
 T. A. Hardgrove, Fondulac, Wis.
 F. S. James, Winona, Minn.
 W. O. Lovett, Brewton, Ala.
 C. B. Miller, Cedar Falls, Iowa.
 W. H. K. Moyer, Little Falls, Minn.
 S. G. McCallin, Chicago, Ill.
 C. H. Oakman, Detroit, Mich.
 J. B. Pherrin, Central City, Iowa.
 F. S. Robinson, Chippewa Falls, Wis.
 F. G. Richardson, Mason City, Iowa.
 G. W. Slingluff, Burlington, Iowa.
 Alice M. Steeves, Boston, Mass.
 J. F. Wallace, Canton, Mo.
 P. H. Wright, Oxford, Miss.
 O. C. Zieger, Owatonna, Minn.
 G. N. Beemer, Mason City, Iowa.
 C. N. Booth, Cedar Rapids, Iowa.
 A. D. Black, Chicago, Ill.
 T. F. Cooke, Burlington, Iowa.
 W. R. Clack, Clear Lake, Iowa.
 A. C. Fawcett, Rochester, Minn.
 C. J. Grove, St. Paul, Minn.
 L. Greenbaum, Philadelphia, Pa.
 G. S. Handy, Natchez, Miss.
 P. H. Jones, Clear Lake, Iowa.
 W. B. James, Tracy, Minn.
 A. M. Lewis, Austin, Minn.
 H. R. Mavis, Minneapolis, Minn.
 G. D. Moyer, Montevideo, Minn.
 F. N. Owens, St. Paul, Minn.
 A. R. Owre, Minneapolis, Minn.

W. S. Pugh, Mobile, Ala.
 W. J. Reynolds, Selma, Ala.
 C. H. Robinson, Wabasha, Minn.
 A. C. Searl, Owatonna, Minn.
 F. G. Van Stratum, Hurley, Wis.
 C. E. Woodbury, Council Bluffs, Iowa.
 F. J. Yerkes, Owatonna, Minn.

Table Clinics.

J. E. Argue, Red Lake Falls, Minn.
 A. P. Burkhart, Buffalo, N. Y.
 H. L. Cruttenden, Northfield, Minn.
 J. C. Corcoran, St. Paul, Minn.
 I. N. Carr, Durham, N. C.
 C. H. Frink, Fernandina, Fla.
 W. L. Fickes, Pittsburg, Pa.
 G. F. Hauser, LaCrosse, Wis.
 F. R. Houston, Green Bay, Wis.
 C. W. Jones, St. Paul, Minn.
 C. H. Land, Detroit, Mich.
 Eugene Müller, Zurich, Switzerland.
 G. C. Marlow, Lancaster, Wis.
 F. A. Peeso, Philadelphia, Pa.
 J. W. Ritter, Charleston, Ill.
 E. F. Summermeier, Eau Claire, Wis.
 S. S. Stowell, Pittsfield, Mass.
 E. F. Tinker, Wheatland, Iowa.
 O. A. Weiss, Minneapolis, Minn.
 L. C. Bryan, Basel, Switzerland.
 G. A. Bowers, Nassau, N. H.
 W. S. Curtis, Montpelier, Vt.
 J. P. Carlisle, Greenville, S. C.
 F. E. Dodeon, Grand Rapids, Mich.
 W. N. Fine, Philadelphia, Pa.
 E. A. Honey, Kalamazoo, Mich.
 J. A. Hall, Collinsville, Ala.
 G. F. Jernigan, New York, N. Y.
 J. L. Kelly, St. Paul, Minn.
 C. W. Lokey, Talladega, Ala.
 W. H. MacNeil, Minneapolis, Minn.
 C. P. Peterson, Mankato, Minn.
 J. B. Ridout, St. Paul, Minn.
 C. F. Rodolf, Muscoda, Wis.
 A. C. Steuerwald, St. Angars, Iowa.
 A. J. Sawyer, Manchester, N. H.
 M. L. Ward, Detroit, Mich.
 J. D. Wise, West Point, Miss.

This constitutes the clinic up to date. But three chairmen have reported from their states. There will be many more names to add to this program when the rest of the reports reach me.

E. K. WEDELSTAEDT, *Ch'man Clinic Section*,
 N. Y. Life bldg., St. Paul, Minn.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, 305 N. Grand ave.,
St. Louis, Mo., *Chairman.*

H. WOOD CAMPBELL, Suffolk, Va., *Secretary.*

F. W. STIFF, 600 E. Grace st., Richmond,
Va., *Treasurer.*

R. H. WALKER, Norfolk, Va.

THOS. P. HINMAN, Atlanta, Ga.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

THE Jamestown Dental Convention will be held in a specially equipped building on the Exposition grounds which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits, and all of these will be held in it. The entrance is outside of the grounds, but access to the grounds may be obtained through it. The building is wired with both direct and alternating current, equipped with running water, is well lighted, and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce bldg., Norfolk, Va. To him exhibitors should apply at once for space—price per foot and a plan of the hall will be sent upon request.

The clinics at the convention are under the supervision and direct control of Dr. C. J. Grievies, Park and Madison aves., Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph N. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each state in the Union and near countries, viz, Canada, Mexico, Cuba, and Hawaii. From these come reports of

the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen are given with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace st., Richmond, Va., who reports memberships rapidly coming in.

The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. Later reports as to hotel accommodations and prices will appear in a subsequent issue.

The membership fee is five dollars, which will entitle members to receive a bound copy of the proceedings. A half-rate—\$2.50—is made to *bona fide* dental students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee for indorsement and acceptance will entitle them to the rights and privileges of the convention.

Dr. E. P. Beadles was elected by the Committee on Organization in February to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention.

Program.

Tuesday, September 10th.

10 A.M.

Meeting called to order by the chairman of the Committee of Organization.

Invocation—Rev. Dr. C. L. Bane, pastor Memorial M. E. Church, Norfolk, Va.

Address of welcome—Hon. Harry St. George Tucker, president of the Jamestown Exposition.

Address of welcome—Hon. Claude A. Swanson, Governor of Virginia.

Address of welcome in behalf of the profession of Virginia—Dr. Joseph W. Eggleston, Richmond, Va.

Address of welcome in behalf of the profession of the South—Dr. B. Holly Smith, first vice-president, Baltimore, Md.

Response to addresses of welcome—Dr. J.

Y. Crawford, honorary president, Nashville, Tenn.

Address by the president—Dr. V. E. Turner, Raleigh, N. C.

11.30 A.M.

Lantern lecture—Prof. W. D. Miller, Berlin, Germany: "Demonstration of Preparations Relating to the Wasting (so-called Erosion) of the Teeth."

Discussion opened by Drs. Wilbur F. Litch, Philadelphia, Pa., and L. G. Noel, Nashville, Tenn.

2 P.M.

Illustrated lecture—Dr. Chas. L. Alexander, Charlotte, N. C.: "Gold Inlays."

Discussion opened by ———.

8 P.M.

Smoker at Inside Inn.

Wednesday, September 11th.

9 A.M. to 1 P.M.

Clinics in Convention Hall.

2 P.M.

Illustrated paper—Dr. F. T. Van Woert, Brooklyn, N. Y.: "Is the Cemented Filling the Filling of the Future?"

Discussion opened by ———.

8 P.M.

Clam-bake or fish-fry on the beach.

Thursday, September 12th.

9 A.M. to 1 P.M.

Clinics in Convention Hall.

2 P.M.

Illustrated lecture—Dr. R. Ottolengui, New York, N. Y.: "The Purposes and Accomplishments of Modern Orthodontia."

Discussion opened by ———.

Officers.

The following officers have been elected by the Committee of Organization:

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-president—Dr. B. Holly Smith, Baltimore, Md.

Secretary-general—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

Chairman of General Clinic Committee—Clarence J. Grieves, Park and Madison aves., Baltimore, Md.

Chairman of General Membership Committee—F. W. Stiff, Richmond, Va.

Vice-presidents—Chas. L. Alexander, Charlotte, N. C. R. R. Andrews, Cambridge, Mass. Waldo E. Boardman, Boston, Mass. Wm. M. Bebb, Los Angeles, Cal. G. V. Black, Chicago, Ill. Edwin C. Blaisdell, Portsmouth, N. H. F. A. Blanchard, Marksville, La. George W. Boynton, Washington, D. C. Truman W. Brophy, Chicago, Ill. Geo. V. I. Brown, Milwaukee, Wis. H. J. Burkhardt, Batavia, N. Y. Chas. S. Butler, Buffalo, N. Y. Wm. Carr, New York, N. Y. Arthur W. Chance, Portland, Ore. Norris R. Cox, Portland, Ore. Wm. Crenshaw, Atlanta, Ga. W. A. Cudworth, Milwaukee, Wis. L. E. Custer, Dayton, Ohio. W. G. Dalrymple, Ogden, Mo. Edwin T. Darby, Philadelphia, Pa. John W. David, Corsicana, Tex. A. J. Derby, Honolulu, Hawaii. Max M. Eble, Louisville, Ky. Edward Eggleston, Richmond, Va. L. C. Elkins, St. Augustine, Fla. W. Leon Ellerbeck, Salt Lake City, Utah. W. W. Evans, Washington, D. C. J. Falero, City of Mexico, Mex. Geo. L. Field, Detroit, Mich. Ricardo Figueroa, City of Mexico, Mex. R. D. Griffin, Paris, Tex. Chas. L. Gunn, Gadsden, Ala. J. A. Hall, Collinsville, Ala. T. M. Hampton, Helena, Mont. Geo. Edwin Hunt, Indianapolis, Ind. Chas. F. Irwin, Vancouver, Washington. S. H. Johns, Wilmington, Del. H. H. Johnson, Macon, Ga. S. F. Kemp, Key West, Fla. H. F. King, Fremont, N. H. D. O. M. LeCron, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa. Geo. E. Longeway, Gt. Falls, Mont. A. A. McClanahan, Springfield, Tenn. T. T. McClanahan, Nashville, Tenn. A. C. McCurdy, Towson, Md. L. B. McLaurin, Natchez, Miss. James McManus, Hartford, Conn. D. J. McMillen, Kansas City, Mo. W. G. Mason, Tampa, Fla. Chas. A. Meeker, Newark, N. J. A. S. Melendy, Knoxville, Tenn. T. M. Milam, Little Rock, Ark. J. H. E. Milhous, Blackville, S. C. W. D. Miller, Berlin, Ger. Geo. E. Mitchell, Haverhill, Mass. T. T. Moore, Co-

lumbia, S. C. Garrett Newkirk, Pasadena, Cal. L. G. Noel, Nashville, Tenn. W. E. Norris, Charlottesville, Va. J. R. Osborne, Shelby, N. C. R. Ottolengui, New York, N. Y. F. A. Shotwell, Rogersville, Tenn. J. D. Patterson, Kansas City, Mo. A. H. Peck, Chicago, Ill. R. W. Quarles, Van Buren, Ark. H. C. Register, Philadelphia, Pa. D. N. Rust, Washington, D. C. R. M. Sanger, Orange, N. J. A. C. Searl, Owatonna, Minn. Alton H. Thompson, Topeka, Kans. Pitt S. Turner, Belton, Tex. Geo. S. Vann, Gadsden, Ala. F. T. Van Woert, Brooklyn, N. Y. Andreas C. Weber, Havana, Cuba. E. K. Wedelstaedt, St. Paul, Minn. Geo. H. Wilson, Cleveland, Ohio. John E. Woodward, New Orleans, La. C. M. Work, Ottumwa, Iowa.

Clinics.

General Clinic Committee. Clarence J. Grieves (chairman), Park and Madison aves., Baltimore, Md. Baskerville Bridgeforth, Richmond, Va. E. J. Tucker, Roxboro, N. C. H. Herbert Johnson, Macon, Ga. F. A. Bowles, Washington, D. C. Joseph T. Meadors, Nashville, Tenn.

STATE CHAIRMEN FOR CLINICS.

Alabama. L. A. Crumly, Hood bldg., Birmingham.
Arkansas. Chas. Richardson, Fayetteville.
California. Frank L. Platt, 712 Steiner st., San Francisco.
Connecticut. Chas. McManus, 80 Pratt st., Hartford.
Colorado. W. E. Sinton, El Paso bldg., Colorado Springs.
Delaware. C. R. Jeffries, New Century bldg., Wilmington.
District of Columbia. H. J. Allen, 303-04 Colorado bldg., Washington.
Florida. Carroll H. Frink, Fernandina.
Georgia. A. M. Jackson, Macon.
Idaho. J. B. Burns, Payette.
Indian Territory—S. E. Long, South McAlester.
Indiana. Carl D. Lucas, Willoughby bldg., Indianapolis.
Iowa. C. M. Work, Ottumwa.
Kansas. Frank O. Hetrick, Ottawa.
Kentucky. E. D. Rose, Bowling Green.

Louisiana. Jules J. Sarrazin, New Orleans.

Maine. H. A. Kelley, 609 Congress st., Portland.

Maryland. George E. Hardy, Baltimore.

Michigan. E. B. Spalding, 4 Adams ave., West Detroit.

Massachusetts. C. W. Rodgers, Dorchester.

Minnesota. J. W. S. Gallagher, Winona.

Mississippi. W. R. Wright, Jackson.

Missouri. E. P. Dameron, DeMenil bldg., St. Louis.

Montana. G. E. Longeway, Great Falls.

Nebraska. H. A. Shannon, Lincoln.

Nevada. J. C. Hennessy, Reno.

New Hampshire. John W. Worthen, Concord.

New Jersey. C. W. F. Holbrook, 2 Saybrook place, Newark.

New York. Wm. Dwight Tracy, New York.

North Carolina. J. A. Gorman, Asheville.

North Dakota. C. L. Rose, Fargo.

Ohio. H. C. Brown, 185 E. State st., Columbus.

Oklahoma. Theo. P. Bringhurst, Shawnee.

Oregon. Arthur W. Chance, Dekum bldg., Portland.

Pennsylvania. H. B. McFadden, 3505 Hamilton ave., Philadelphia.

Rhode Island. Dennis F. Keefe, 315 Butler Exchange, Providence.

South Carolina. Thomas T. Moore, Jr., Columbia.

South Dakota. E. S. O'Neil, Canton.

Tennessee. A. J. Cottrell, Knoxville.

Texas. John W. David, Corsicana.

Utah. William Leon Ellerbeck, 21 Hooper bldg., Salt Lake City.

Vermont. E. O. Blanchard, Randolph.

Virginia. R. L. Simpson, Richmond.

Washington. C. A. Custer, Chapin block, Seattle.

West Virginia. F. L. Wright, Wheeling.

Wisconsin. W. A. Cudworth, Milwaukee.

Mexico. J. Falero, 18 Tacuba, City of Mexico.

Cuba. Andres G. Weber, Corales 1 Esquina Egido, Havana.

Hawaii. A. J. Derby, Honolulu.

Membership.

General Membership Committee. F. W. Stiff (chairman), 600 East Grace st., Rich-

mond, Va. A. S. Melendy, Knoxville, Tenn.
Wm. Crenshaw, Atlanta, Ga. M. S. Merchant,
Mason bldg., Houston, Tex.

STATE CHAIRMEN FOR MEMBERSHIP.

Alabama. C. S. Gunn, Gadsden.
Arkansas. T. M. Milam, Mann bldg., Little Rock.
California. J. Lorenz Pease, Oakland.
Connecticut. Frederick T. Murlless, Jr., Windsor Locks.
Colorado. Henry F. Hoffman, 612 California bldg., Denver.
Delaware. S. H. Johns, Wilmington.
District of Columbia. Wm. N. Cogan, Washington.
Florida. F. E. Buck, Jacksonville.
Georgia. Walter G. Miller, Augusta.
Idaho. J. H. Lewis, Nez Perce.
Illinois. Frederick B. Noyes, Stewart bldg., Chicago.
Indiana. Fred. R. Henshaw, Middletown.
Indian Territory. J. M. Staples, Atoka.
Iowa. F. T. Breene, Iowa City.
Kansas. F. C. Corey, Council Grove.
Kentucky. A. B. Dixon, Glasgow.
Louisiana. C. Victor Vignes, Macheca bldg., New Orleans.
Maine. Will S. Payson, Castine.
Maryland. W. C. Foster, 9 West Franklin st., Baltimore.
Massachusetts. Waldo E. Boardman, 419 Boylston st., Boston.
Michigan. Albert L. LeGro, 271 Woodward ave., Detroit.
Minnesota. James E. Weirick, St. Paul.
Mississippi. A. E. Tillman, Vicksburg.
Missouri. D. O. M. Le Cron, Mo. Trust bldg., St. Louis.
Montana. T. M. Hampton, Helena.
New Jersey. Alphonso Irwin, Camden.
Nebraska. E. H. Bruening, Omaha.
New Hampshire. H. P. Baldwin, Manchester.
New York. H. Clay Ferris, 1166 Dean st., Brooklyn.
North Carolina. C. A. Bland, Charlotte.
Ohio. L. P. Bethel, Columbus.
Oklahoma. G. L. White, Oklahoma City.
Oregon. George H. Nottage, Portland.
Pennsylvania. Howard E. Roberts, 1517 Locust st., Philadelphia.

Rhode Island. Albert L. Midgley, 312 Butler Exchange, Providence.

South Carolina. L. P. Dotterer, Charleston.

South Dakota. G. W. Collins, Vermilion.
Tennessee. Justin D. Towner, Memphis.
Texas. Rufus W. Carroll, Beaumont.
Utah. W. G. Dalrymple, Ogden.
Vermont. K. L. Cleaves, Montpelier.
Virginia. Wm. Pilcher, Petersburg.
Washington. F. J. Shaw, Burke block, Seattle.

West Virginia. Chas. H. Bartlett, Parkersburg.

Wisconsin. W. H. Mueller, Madison.
Mexico. Ricardo Figueroa, 1 Calle de Santo Domingo 8, City of Mexico.

Canada. Theodore C. Trigger, St. Thomas, Ontario.

Hawaii. E. L. Hutchinson, Honolulu.

The clinics and exhibits at the Jamestown Convention are to be its interesting features.

Manufactures Exhibit.

The Committee on Manufactures Exhibit—Dr. John Manning, Norfolk, Va.—will show the latest and best dental instruments, appliances, machinery, furniture, and materials.

Orthodontia Exhibit.

Dr. Harry E. Kelsey (chairman), Baltimore, Md. The Committee on Orthodontia exhibit expect to have displayed at the Jamestown Dental Convention the best and most complete collection obtainable in the country, of models and appliances illustrating the treatment of the various classes of orthodontia cases. The committee also hopes to have exhibited rare and valuable collections illustrative of the progress of the science of orthodontia from its beginning down to the present day, thus adding an historical feature to the display. The rare and valuable collection of models of the American Society of Orthodontists has already been secured, and several of the most prominent orthodontists of the country have promised to contribute. In addition to this, Dr. R. Ottolengui will read a paper before the general body on "The Purposes and Accomplishments of Modern Orthodontia," which will be a paper reviewing and comparing the best in all methods to date.

Surgical Clinic.

Dr. L. M. Cowardin (chairman), Richmond, Va. Dr. J. Y. Crawford, Nashville, Tenn. Dr. A. G. Friedrichs, New Orleans, La.

Under this head a number of important surgical operations of the mouth, face, and jaw will be performed. Among the well-known operators who have signified their intention to operate are—Drs. G. V. I. Brown, Milwaukee, Wis.; W. A. Bryan, Nashville, Tenn.; Wm. Perrin Nicolson, Atlanta, Ga.; B. Holly Smith, Baltimore, Md.; V. P. Blair, St. Louis, Mo.; Frederick B. Moorehead, Chicago, Ill.; Randolph Winslow, Baltimore, Md.

Committee on Comparative Odontology.

Dr. Wm. Bebb (chairman), Los Angeles, Cal. Dr. A. H. Thompson (sec'y), Topeka, Kansas.

In this exhibit there will be about two thousand specimens illustrating comparative odontology, together with a number of pathological specimens showing the effects of rickets, actinomycosis, etc., upon the teeth and the bones of the face. The latter are probably the most interesting feature of the collection.

There will be specimens dissected to show the attachment and the development, others displaying the skin, skull, and teeth of the various animals, together with a number of extracted teeth of mammals. The invertebrates, fishes, reptiles, and birds will be represented by their food-reducing organs. A number of human skulls will be displayed, together with a collection of pathological human teeth. The collecting, preparation, and mounting of the specimens of Dr. Wm. Bebb, all of which work has been done by the exhibitor, is a feature of the exhibit which will be of interest to many. The pathological specimens, which may possibly have some bearing upon human dental pathology, are the most interesting part of the collection to the average dental student, and in this respect the Bebb collection is unique in having a larger number of these than any other, so far as known. Those that Dr. Bebb collected himself are certainly more authentic than any which might be obtained from a commercial collector. This collection was ex-

hibited at the Portland Dental Congress and received the hearty praise of all those who saw it.

The U. S. Naval Dental Exhibit.

Dr. Richard Grady (chairman), Annapolis, Md.

The U. S. Naval Dental Exhibit will include many hundreds of charts of the teeth of young men from sixteen to twenty-four years of age from all parts of the country, showing at a glance, and far more impressively than printed words could ever do, teeth filled, crowned, treated, extracted, unerupted, irregular, etc.; also the size of cavity on individual surfaces of teeth; also kind of filling, or crown or bridge.

The character of the work, if gold, is designated with gold paint; if amalgam, with aluminum paint. Much valuable information is to be found in memoranda of anything of special importance, malformation and malposition of teeth and jaws, mechanical injuries to teeth and jaws, polypus of pulp, pyorrhea, erosions, stains, reflex pains, regulating appliances, painful and difficult eruption of third molars, etc. The records, showing where caries is localized, extend over a period of years, and it is hoped that some day this store of recorded dental knowledge will be tabulated, and the result of observation and study brought before the profession as scientific questions for consideration and interpretation. While the charts are simple official records of the peculiarities of the teeth and of the operations performed upon them, yet they have furnished reliable evidence in several cases of drowning, as the teeth maintained their features and peculiarities when other external signs were wanting in establishing personal identity. A summary of the relative frequency of dental caries after sixteen years of age (and before, in permanent teeth) with number of teeth present, fillings, crowns, and bridges will also be exhibited.

Committee on Dental History.

Dr. Wm. H. Trueman (chairman), Philadelphia, Pa. Dr. Chas. McManus (sec'y), Hartford, Conn.

This exhibit will show a collection of photographs, early certificates and diplomas, por-

traits of distinguished practitioners, collections of ancient dental instruments, and specimens of dental prosthetic skill, porcelain work, etc.; a photograph of title-pages of early American dental literature, books and journals, etc. The Committee on History will also prepare a report on the contribution of pioneer southern dentists, and of dental colleges and societies of the southern states. This will be published in the proceedings.

For further information address

H. W. CAMPBELL, *Sec'y*, Suffolk, Va.

Transportation Rates.

The following rates to the Exposition have been made by the transportation lines: Season tickets, 80 per cent. of double one way; sixty-day ticket, one and one-third fare plus 25 cents; ten-day ticket, one and one-third fare plus \$2.25. These rates will probably be lessened, or, if not, there are likely to be special excursions from all parts of the country and Canada at low rates.

The following places of interest can be visited as side trips: Jamestown Island, \$1.00; Yorktown, \$1.00; Williamsburg, \$1.95; Washington, \$3.50; Baltimore, \$5.00; New York (Old Dominion Steamship Co.), \$13.00 round trip; Philadelphia, by rail, \$9.00 round trip; Richmond, \$3.50 round trip.

Several watering places are within a few minutes' ride of Norfolk and the Exposition grounds.

For further information address Committee on Transportation, Jamestown Dental Convention: J. Lewis Walker, A. Allison Stores, W. M. Sturgis, Norfolk, Va.

H. WOOD CAMPBELL, *Sec'y Committee on Organization*, Suffolk, Va.

NOTICE FROM N. D. A. COMMITTEE ON THE HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the

committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 500, leaving 200 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.

WM. H. TRUEMAN, Philadelphia.

GORDON WHITE, Nashville, Tenn.

H. L. AMBLER, Cleveland, Ohio.

JAS. McMANUS, Hartford, Conn.

J. Y. CRAWFORD, Nashville, Tenn.

A. H. FULLER, St. Louis, Mo.

S. A. FREEMAN, Buffalo, N. Y.

W. E. BOARDMAN, Boston, Mass.

CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.

CHAS. McMANUS, *Ch'man*, Hartford, Conn.

PRIZE OFFERED BY ROTTERDAM DENTAL SOCIETY.

A GNATHO-DYNAMOMETER WANTED.

THE Rotterdamsche Tandheelkundige Vereeniging offers a reward of f. 300 (\$120, 25) for the invention of a gnatho-dynamometer that will be suited for use in dental practice.

The instrument must be able to record a maximum pressure of at least 200 kilograms. Below 20 kgm. the limit of error must not exceed 1 kgm., while with heavier pressure it should remain within 2 kgm.

The bite-contact plates must allow the making of a record within a distance of 1 cm.

Although the instrument has only to record the pressure in one direction, it ought to work also with a moderate lateral movement. With the front teeth, only the pressure with edge-to-edge bite, not with overbite, is to be measurable.

The instrument must be simple, strong, and capable of being sterilized as far as it comes in contact with the mouth. The bite-plates must not do damage to the teeth. When used, the recording apparatus ought to be readjustable.

Competitors are requested to send, free, specimens until October 1, 1908, to the Rotterdamsche Tandheelkundige Vereeniging, 115 Aert van Nesstraat, Rotterdam, accompanied by a motto and a description of the mode of use; and in addition a sealed envelope signed with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, I. J. E. de Vries, Amsterdam; C. H. Witthaus, Rotterdam; besides a technical expert. The jury will make its decision in December 1908.

The result will be communicated to all competitors, and their instruments will be returned.

The prize will be delivered in January 1909, during the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

Dental and technical papers are requested to publish this notice.

M. ISEBREE MOENS, *Sec'y*.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE thirty-seventh annual convention of the South Carolina State Dental Association will be held in the city of Anderson, S. C., commencing July 2, 1907, and continuing through the 3d, 4th, and 5th.

Special hotel rates have been secured; also one and one-third railroad rates on the certificate plan. We expect a glorious meeting, and all ethical practitioners are most cordially invited to attend.

EASTON N. KIBLER, *Cor. Sec'y*,
Prosperity, S. C.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-seventh annual meeting of the New Jersey State Dental Society will be held in the Auditorium at Asbury Park, N. J., commencing 10 A.M. July 17th and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia, at the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st.

Prominent dentists have signified their intention of reading papers, and the clinics will all be of a new and novel nature. Clinic committee in charge of Charles H. Dilts,

Trenton, N. J.; exhibit committee in charge of Walter Woolsey, Elizabeth, N. J. Programs will be out June 15th.

Last year over eight hundred dentists registered in attendance. The auditorium where the meeting is held is the largest and best adapted building on the Jersey coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Pennsylvania State Dental Society will hold its thirty-ninth annual meeting on July 9, 10, and 11, 1907, at the Schenley Hotel, Pittsburgh, Pa.

LUTHER M. WEAVER, *Sec'y*,
Philadelphia, Pa.

MAINE DENTAL SOCIETY.

The forty-second annual meeting of the Maine Dental Society will be held at Rockland, Me., July 16, 17, and 18, 1907.

H. A. KELLEY, *Sec'y*,
609 Congress st., Portland, Me.

TENNESSEE STATE DENTAL ASSOCIATION.

CHANGE IN DATE OF MEETING.

The fortieth annual meeting of the Tennessee State Dental Association will be held at Knoxville, Tenn., July 8, 9, and 10, 1907. All are cordially invited. Reduced railroad rates will be secured, and a successful meeting is anticipated.

R. J. MCGAVOCK, *Sec'y*,
Columbia, Tenn.

VIRGINIA STATE DENTAL ASSOCIATION.

The Virginia State Dental Association will hold its annual meeting September 9, 1907, at the Inside Inn, Jamestown Exposition. There will be only a short session, as the activities of our members are being merged with those of the Jamestown Dental Convention. This will be strictly a business meeting; no committees will be appointed, and no work done other than certain

important matters of business, which will be designated later in a circular letter to be issued to each member.

W. H. PEARSON, *Asst. Cor. Sec'y*,
Hampton, Va.

NORTHEASTERN DENTAL ASSOCIATION.

The thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Me., at the Hotel Lafayette, October 16, 17, and 18, 1907. Preparations are being made for a valuable and instructive meeting.

-EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

ARMY DENTAL CORPS.

LEAVE for two months is granted Dental Surg. Samuel W. Hussey, to take effect upon his arrival in the U. S. (May 27, W. D.)

Dental Surg. Samuel W. Hussey, from duty in the Philippines, to take effect at such time as will enable him to comply with this order, and will proceed by the first available transport sailing from Manila after August 1, 1907, to San Francisco, for further orders. (May 25, W. D.)

Dental Surg. Hugh G. Voorhies, now at the General Hospital, Presidio of San Francisco, will proceed to Fort D. A. Russell for duty, relieving Dental Surg. Franklin F. Wing, who will proceed to San Francisco and take transport to sail from that place about July 5, 1907, for the Philippine Islands. (May 28, W. D.)

Contract Dental Surg. Ralph W. Waddell from duty at the post of Parang, Mind., to the post of Zamboanga, Mind., for duty. (March 28, D. Mind.)

Contract Dental Surg. O. M. Sorber will proceed by the first available transportation to the post of Zamboanga, for duty. (March 20, D. Mind.)

Dental Surg. Edwin P. Tignor, now at Tacoma, Wash., will proceed to Fort Leavenworth, for temporary duty, relieving Dental Surg. Raymond E. Ingalls.

Upon the return of Dental Surg. John D. Millikin to Fort Leavenworth, Dental Surg. Tignor will proceed to Fort Adams for duty, relieving Dental Surg. F. Homer Wolven.

Dental Surg. Ingalls when relieved at Fort Leavenworth will proceed to San Francisco, and take the first available transport for the Philippine Islands, for duty.

Dental Surg. Wolven upon being relieved at Fort Adams will proceed to San Francisco and take the first available transport for the Philippine Islands for duty. (June 6, W. D.)

The leave granted Dental Surg. George L. Mason is extended one month. (June 12, W. D.)

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

At the annual meeting of the Southern Wisconsin Dental Association the following officers were elected for the ensuing year: G. C. Marlow, president; J. H. Reed, first vice-president; F. S. Knapp, second vice-president; C. W. Collver, secretary; W. G. Hales, treasurer. The meeting next year will be at Platteville, Wis.

C. W. COLLVER, *Sec'y.*

NORTH DAKOTA DENTAL ASSOCIATION.

At the annual meeting of the North Dakota Dental Association, officers were elected as follows: H. L. Starling, president; F. G. Thompson, vice-president; O. H. Sossaman, secretary; S. Rowan, treasurer. The association meets on the second Tuesday of May each year. Devil's Lake was selected as the next meeting-place.

O. H. SOSSAMAN, *Sec'y,*
Lisbon, N. D.

VERMONT STATE DENTAL SOCIETY.

At the thirty-first annual meeting of the Vermont State Dental Society, held at Burlington, Vt., May 15, 16, and 17, 1907, the following officers were elected for the ensuing year: C. H. Kent, Barre, president; Harry F. Hamilton, Newport, first vice-president; Charles F. Meacham, Bellows Falls, second vice-president; Thomas Mound, Rutland, recording secretary; Grace L. Bosworth, Rutland, corresponding secretary; W. H. Munsell, Wells River, treasurer. Executive Com-

mittee—A. Z. Cutler, Bennington; P. M. Williams, Rutland, and L. E. Mellen, Middlebury.

The next meeting will be held the third Wednesday in May 1908, the place of meeting to be decided upon later.

THOMAS MOUND, *Sec'y,*
Rutland, Vt.

ILLINOIS STATE DENTAL SOCIETY.

THE Illinois State Dental Society held its forty-third annual meeting at Quincy, May 14th to 17th, 1907. The following officers were elected for the ensuing year: W. A. Johnston, Peoria, president; Henry L. Whipple, Quincy, vice-president; Arthur D. Black, Chicago, secretary; C. P. Pruyn, Chicago, treasurer; J. T. Cummins, Metropolis, librarian.

The next meeting will be held at Springfield, May 12, 13, 14, and 15, 1908.

ARTHUR D. BLACK, *Sec'y,*
31 Washington st., Chicago, Ill.

SECOND DISTRICT (N. Y.) DENTAL SOCIETY.

THE annual meeting of the Second District Dental Society of New York State was held in their rooms in the Kings County Medical Building, Bedford ave., Brooklyn, on the evening of April 8, 1907, with the president, Charles F. Ash, in the chair.

The following officers were elected for the ensuing year: R. C. Hutchinson, Jr., president; W. N. Fraser, vice-president; Paul R. Stillman, recording secretary; W. G. Lewis, corresponding secretary; W. W. Thompson, treasurer; E. H. Babcock, librarian. Executive Committee—Horace P. Gould (chairman), R. Ottolengui, and Ellison Hillyer.

PAUL R. STILLMAN, *Recording Sec'y,*
Brooklyn, N. Y.

MAINE BOARD OF EXAMINERS.

THE next regular meeting of the Maine Board of Dental Examiners will be held at Portland, Me., beginning on Monday, July 8, 1907, at 2 P.M.

DANA W. FELLOWS, *Sec'y,* Portland, Me.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners of the District of Columbia will take place July 1, 2, and 3, 1907. All applications must be accompanied with a fee of ten dollars, and should be filed not later than June 22d with

WM. B. DALY, *Sec'y*,
1340 New York ave. N. W., Washington, D. C.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State-house, Providence, R. I., Tuesday, Wednesday, and Thursday, July 9, 10, and 11, 1907. Application blanks and particulars may be obtained of

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

WYOMING BOARD OF EXAMINERS.

THE Wyoming State Board of Dental Examiners will meet in Sheridan, Wyo., on July 1, 2, and 3, 1907, for the examination of candidates. All applications, together with a fee of \$25.00, must be in the hands of the secretary not later than June 25th.

For further information and application blanks address

PETER APPEL, JR., *Sec'y*,
P. O. Box 643, Cheyenne, Wyo.

VERMONT BOARD OF EX- AMINERS.

A MEETING of the Vermont State Board of Dental Examiners for the examination of candidates will be held at the State-house, Montpelier, Vt., Monday, Tuesday, and Wednesday, July 1, 2, and 3, 1907, commencing at 2 o'clock of July 1st. All applications, together with the fee, \$25.00, must be in the hands of the secretary not later than June 23d.

GEO. F. CHENEY, *Sec'y*,
St. Johnsbury, Vt.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1907.

May 7.

No. 852,413, to E. C. BENNETT. Removable dental bridge work.

May 14.

No. 853,421, to F. RITTER. Dental chair.
No. 853,431, to A. B. ALLEN. Inhaler.
No. 853,439, to A. C. CLARK. Inhaler.

May 21.

No. 853,984, to C. F. LAUDERDALE. Tooth-crown model.

No. 854,283, to J. M. EVEY. Dental root-impression and crown-mounting instrument.

No. 854,486, to J. F. GIBSON. Display carrier for artificial teeth.

May 28.

No. 854,842, to J. RAMSPERGER. Artificial tooth.

No. 854,898, to H. LORENZ. Mouth-brace.
No. 855,288, to F. W. DEAN. Handpiece for dental engines.



DR. JOHN I. HART.

THE DENTAL COSMOS.

VOL. XLIX.

AUGUST 1907.

No. 8.

ORIGINAL COMMUNICATIONS.

DR. MILLER'S OBSERVATIONS ON THE WASTING OF TOOTH TISSUE, VARIOUSLY DESIGNATED AS EROSION, ETC., VIEWED IN THEIR RELATION TO THE POWER POSSESSED BY SALIVA OF CONTROLLING ACID DECALCIFICATION.

By JOSEPH HEAD, D.D.S., M.D., Philadelphia, Pa.

AS one who has been experimenting for the last four years on the subject of enamel erosion and abrasion, I should like to offer a few criticisms on Dr. Miller's detailed and suggestive work.

In the *Cosmos* for April 1907, page 406, I asked why Dr. Miller relies upon the litmus paper test to determine the alkalinity, neutrality, or acidity of the saliva, when the same saliva will frequently turn blue litmus red, and red litmus blue; while Sutton, the great authority on acidimetry, says that a saliva which is neutral to litmus may be acid to turmeric paper and alkaline to lacmoid or Congo red?*

In the July *Cosmos*, page 677, Dr. Miller in answer says: "I have no particular litmus test, but made use of the test as ordinarily em-

ployed in chemical laboratories." Later on in the same article (page 678) he says: "I am therefore perfectly willing to admit that tests of the saliva made by litmus may not always be reliable."

If Dr. Miller did not employ the litmus test in a manner peculiar to himself, or did not think it particularly reliable, why does he give such specific directions for its use as in the March *Cosmos*, page 228: "The reaction of the mucus of the upper as well as the lower lip should be taken by lifting up the lip and inserting a strip of blue litmus paper on one side of the jaw and red on the other, leaving it there until saturated. To determine whether the acid comes from the lip or from the gums insert two pieces of litmus paper separated by any impermeable substance which does not affect the reaction. The reaction should be taken before rinsing the mouth, as *in this*

* "Volumetric Analysis," page 39.

way only do we obtain true information as to the condition present at the time." [Italics mine.]

If Dr. Miller knew that the litmus test was "not always reliable," why, in the March Cosmos, pages 228 and 229, does he report fifty-two litmus tests on various patients and twenty-five made by Mr. Brusendorf? If litmus is "not always reliable" in determining the practical acidity or alkalinity of the saliva, would not all the deductions made from those seventy-seven tests be valueless—or at least misleading from a person of such authority as Dr. Miller?

As a further proof of this inadequacy of litmus, if anyone will make a 1:20,000 water solution of (Kahlbaum's or Merck's) acid sodium phosphate, he will find that it will neither turn blue litmus red nor red litmus blue. And yet if a tooth be placed in this solution, at the end of from ten to twenty days the enamel will be translucently whitened, softened to the cut of a lancet, and in some cases corroded, especially where the enamel cuticle has been ground off and the spot polished. In fact, a 1:20,000 solution of acid sodium phosphate in most of the tests will act more vigorously than a 1:20 or 1:2000 solution of the same salt. The fact that a weak acid will sometimes accomplish what a strong acid cannot will be dwelt upon later.

In the July Cosmos, page 678, Dr. Miller says at length: "While I am therefore perfectly willing to admit that tests of saliva made by litmus may not always be reliable, I do not see how a stricter observance of this fact could have materially modified the results of my investigations, since *I was not dealing with general but with local defects, in which the general condition of the saliva is not of primary importance.*" [Italics mine.] ". . . The question to be solved is this: If we add the dibasic sodium phosphate to a solution of the acid sodium phosphate or of the acid calcium phosphate until the solution turns red litmus paper blue or until the reaction of the acid salts is obscured, do these salts still retain their action on the tissues of the tooth?" He then shows a

series of experiments on dentin sections with the acid and basic phosphates that conclusively prove that where there is enough basic phosphate in a solution of acid phosphate to turn red litmus blue, there is no action on the dentin. As Dr. Miller says, "This question cannot be answered by theoretical deductions." (July Cosmos, page 679.)

For some time past I have been experimenting on the effect of a similar mixture of acid sodium phosphate and basic sodium phosphate on tooth enamel, and I know that not only is Dr. Miller right in his conclusion that an acid phosphate mixture modified by a basic phosphate mixture to the point of turning red litmus blue and blue litmus red would not hurt enamel, but I would say further that a mixture of acid sodium phosphate with so small an amount of the basic sodium phosphate as not to blue the color of red litmus paper in the slightest degree may still have no perceptible effect on the enamel of the tooth.

Test: A 1 per cent. solution of acid sodium phosphate and a 1 per cent. solution of tribasic sodium phosphate were made. Of these, 38 ccm. of the acid salt solution were mixed with 10 ccm. of the basic salt solution. This mixture would turn blue litmus red, but would not in the slightest degree turn red litmus blue. A piece of natural enamel placed in this solution kept at body temperature for from sixteen to eighteen days was absolutely unharmed, while other pieces in a 1 per cent. solution of acid sodium phosphate alone (Merck's) were decalcified in half the time.

Thus we have a further proof of the error into which litmus may lead us. If a solution turns blue litmus red and fails to change red litmus blue, the presumption according to the litmus is that there is enough acid present to hurt the tooth, when in reality the corroding action of the acid may be under control. Thus the litmus may be the means of leading the clinician or scientist astray. It is about as reliable as if the engineer of a railroad did not know whether the red light meant danger or safety.

For the sake of those following in Dr. Miller's footsteps, I am glad that

he admits in his letter in the July Cosmos that the litmus test is not "always reliable." But if it be not "always" reliable, how is anyone to know when it may be relied upon and when it may not? At present we have to confess that we have no means of detecting minute quantities of acid in the saliva that may nevertheless be sufficient to corrode the teeth; while, on the other hand, acid may be plainly indicated and yet no harmful action result.

DR. MILLER'S ABRASION TESTS.

Dr. Miller's abrasion tests with grit powders and brush alone are valuable, and are no doubt accurate, because the question of saliva acidity or alkalinity does not materially enter as a factor. These conclusions agree almost absolutely with the conclusions of some less extensive tests which I made on the subject some two years ago, and which were published in the *Dental Brief*.* Dr. Miller (July Cosmos, page 678) speaking of my *Dental Brief* paper on abrasion, says that because I said there might be a chemical as well as a mechanical cause, and suggested acid calcium phosphate, I did not foresee that other acids or acid salts could also cause erosion. When I wrote that article I had found by numerous experiments that very weak solutions of many acids combined with a minimum of abrasion might cause wasting. I only mentioned acid calcium phosphate as one of the salts which caused decalcification with a smooth surface, and therefore might *possibly* cause erosion without abrasion. I am at present in doubt on this possibility. Very weak solutions of lactic acid or acid sodium phosphate will also make smooth decalcification surfaces without abrasion as an adjunct, and there are probably others yet to be found.

The procedure in Dr. Miller's simple abrasion tests is not questioned, but when we come to examine his tests of the alternate action of abrasives and acids on the teeth, his technique is open to question. For instance, on pages 117-

122 of the February Cosmos he gives twenty-three experiments on the alternate effect of acids and abrasives on teeth; solutions of tartaric, oxalic, lactic, citric, sulfuric, phosphoric, and hydrochloric acids are used in from 1 to 10 per cent. solutions. In Dr. Miller's simple friction tests he took pains to approximate normal conditions, while in these acid tests he has used solutions that could not possibly be found naturally in the mouth. Should he not at least have reduced his solutions to a point where they could be tasteless? If 1 part lactic acid to 2000 parts of water be very perceptible to the taste, and if 1 part lactic acid to 1000 parts of saliva be noticeable to the taste, it follows that the strong solutions used render all of the acid abrasion tests open to question, and before reliable data can be had on the subject they will all have to be repeated with solutions that could be normally found in the mouth. While some strong acids will unquestionably corrode where a weaker solution will not, it must be remembered that with some acids a weaker is more corrosive than a stronger solution. For instance, if a tooth be placed in pure anhydrous sulfuric, lactic, valeric, or butyric acid, it will stay unharmed for days and weeks at a time, but a 1:10,000 or 1:20,000 lactic acid and 1:5000 valeric or butyric acid will perceptibly attack both enamel and dentin.

In March Cosmos, page 229, Dr. Miller says that a 1 per cent. solution of acid sodium phosphate acted upon a section of a tooth for six weeks without producing the slightest visible effect upon either enamel or dentin. He also says that a 5 per cent. solution of acid sodium phosphate, acting for a year, only superficially disintegrated the external surface of a sound tooth. I have found, in experimenting with this salt in 1 per cent. and 5 per cent. watery solutions, that the acid sodium phosphate does not attack the enamel so as to roughen it, but leaves it translucently white and smooth. This has also been the experience of Dr. Kirk. This very mildness of the action of the acid sodium

* See *Dental Brief*, vol. xi, page 279.

phosphate is just the action that would make smooth erosion with a minimum of abrasion, and Dr. Miller must have been looking only for the corrosive, harsh actions of his 5 to 10 per cent. solutions when he wrote in *March Cosmos*, page 229, "With my present understanding of the subject I have some difficulty in recognizing the acid sodium phosphate as a potent agent in the process of chemical abrasion, because of its comparatively slight action upon the hard tissues of the tooth." He certainly overlooked the possible mild, smooth, deteriorating action on the enamel of very weak solutions of acid sodium phosphate, acid calcium phosphate, or lactic acid, when he said in *March Cosmos*, page 246, "Acids in general, especially in the strength in which they occur in the mouth, cannot produce wasting." But one fact partially explains Dr. Miller's differences in observation: 1:20,000 acid sodium phosphate will, in many instances, more deeply and effectively cut tooth enamel than 1 part to 20. I here give a few tests, chosen from the many that I have repeatedly tried, which I should be glad if Dr. Miller or any others who are interested would repeat for verification.

THE WRITER'S TESTS ON CORROSION OF ENAMEL BY ACID.

The following tests on corrosion of enamel by acid were made on teeth incased in rubber tubing tied at the end near the tip of the root. A point of enamel was left exposed. By pressing the rubber back, absolute comparison of exposed and protected enamel could be made at any time. The teeth before they were used were first washed and kept for a week in 50 per cent. alcohol and glycerin. During the tests the enamel was not only examined macroscopically for color changes or roughening, but it was also tested with a sharp lancet to see if its resisting strength was being undermined by the effect of the acid. The tests were made with C. P. acid sodium phosphate obtained from Merck's and also from Kahlbaum's laboratories. The enamel cuticle seemed

to protect some teeth more than others. Some teeth only corroded on the edge of the enamel that had been battered by mastication or where the enamel had been cut with a stone and polished. Some showed a smooth surface that seemed normal except when cut by the lancet, while others gave a white, soft, paint-like surface that was easily scaled off.

Teeth rubber-protected except for a small portion of projecting enamel were placed in acid sodium phosphate solutions of 5 per cent., 2 per cent., 1 per cent., and 1:500 respectively. Each solution was in amount about 200 ccm. They were put in sealed jars and placed in a culture oven at body temperature. After seventeen hours' immersion all these teeth had smooth, white, polished, decalcified surfaces which when dried approached the normal appearance. Later, a tooth was placed in 1:20,000 solution of acid sodium phosphate. At the end of fourteen hours the first signs of corrosion were noticeable. This was polished off with stone and polisher. Eight hours later it was examined, when unmistakable whitening of the polished part was noticeable. In two days decalcification occurred that could be easily pared with a lancet. In ten days it was badly corroded, with a smooth, white surface.

In some other tests a 5 per cent., 1:2000 and 1:20,000 solutions were used simultaneously. At the end of eight hours the tooth in the 5 per cent. solution showed unmistakable signs of decalcification, while the 1:2000 and 1:20,000 solutions showed no decalcification. At the end of twenty-four hours the tooth in the 5 per cent. solution still showed progressive signs of decalcification, the tooth in the 1:20,000 solution also showed positive decalcification, while the tooth in the 1:2000 solution remained apparently untouched. At the end of seven days the tooth in the 1:2000 solution still showed no decalcification, and it was then placed in the 1:20,000 solution, and in seven days more it was plainly decalcified, showing that the 1:20,000 acid sodium phosphate solution decalcified enamel that had withstood a 1:2000 solution. Also, while the 1:20,000 acid sodium phosphate solution did not start as quickly to decalcify the enamel as the 1:20 solution, the action of the 1:20,000 solution of acid sodium phosphate was more uniformly progressive, and ended by cutting the enamel much more deeply than the 1:20 solution.

As I have before stated, enamel resists

the decalcification of acids or acid salts most unevenly and erratically. The battered enamel at the cutting edge or near the point of a cusp is usually attacked first, but not always. Sometimes one tooth will resist a solution that will rapidly attack another tooth of apparently just as sound structure, under apparently the same conditions. In fact, the subject of tooth decalcification by such acid solutions as may be found in the mouth is a very large subject, and much work needs to be done before an authoritative statement can be made on the matter.

The white spots made by the acid action of acid sodium phosphate or acid calcium phosphate are so much like the white spots that frequently appear in the mouths of many patients that it is possible that the acid sodium phosphate or acid calcium phosphate may be the cause of the strangely appearing smooth white enamel surfaces that have so long mystified us. The smooth erosion of the acid phosphate salts is explained by Dr. Kirk by the fact that as the acid phosphate attacks the enamel surface it is converted into the basic phosphate, which is precipitated, and this necessarily retards the action of the acid salt.

NEED OF CONTROL TESTS WITH SALIVA SOLUTIONS.

Let us now discuss the advisability of control tests with saliva solutions. On pages 115 and 116 of the February *Cosmos* Dr. Miller speaks as follows: "The question has been brought up as to whether solutions of acids in water act differently from the same solutions in saliva. I have only one experiment to report on this question. Teeth were halved and the corresponding halves were subjected to a semi-saturated solution of acid calcium phosphate in water and in saliva respectively for thirty-four days. The action of the water solution seemed to be more intense than that of the solution in saliva." Thus Dr. Miller puts aside the necessity for control tests with saliva by saying that the action of the watery solution is more intense than the

saliva solutions. He is certainly correct in his observation, but it falls far short of the true significance of saliva action. Saliva not only retards the action of acids, but in many instances absolutely inhibits it.

Take for example Dr. Miller's test of the action of carbonic acid on tooth structure. Because, as stated in February *Cosmos*, page 115, he finds a tooth becomes decalcified by water charged with CO_2 , and because he used a watery solution of CO_2 where the gas bubbles passed the submerged tooth and corroded it in four days (March *Cosmos*, page 226), he concludes that "carbonic acid attacks both dentin and enamel vigorously" (page 246). Unquestionably a watery solution of CO_2 will decalcify tooth structure, but to argue from that that CO_2 from the lungs or the CO_2 in the saliva would also cut the teeth would be to prove Nature guilty of a foolish oversight. If CO_2 either in the saliva or from the breath could decalcify enamel, long before any of us came on the earth there would not be any enamel. With that preliminary thought I made the following test: An ordinary "sparklet" siphon was used for these experiments, and they were carried on, as were all the tests, in a culture oven where a temperature of 98°F . was constantly maintained:

A tooth was incased in rubber tubing as previously described, a small portion of sound enamel being exposed. This was done so that the contrast between the exposed enamel and the unexposed might be noted, and the first change could thus more readily be detected. Such a tooth was placed in the siphon with about two ounces of water, the contents of a steel shell of condensed CO_2 were discharged into the solution, and the flask was placed in a culture oven. At the end of twenty-four hours the tooth was taken out and examined. The enamel showed distinct signs of decalcification. The same tooth was replaced in the flask and the solution again charged with CO_2 , as before. At the end of three days the enamel was so badly cut that portions of it could easily be scraped off with the thumb-nail.

Then a new rubber-protected tooth with a small portion of the enamel exposed was

placed in the flask with two ounces of saliva, a few drops of chloroform being added as usual to prevent fermentation, and the same amount of CO_2 discharged into the solution. At the end of four days the tooth was removed and examined, and the enamel was smooth and sound. A new solution of saliva was made, and was charged with CO_2 . At the end of thirty days it was removed, and the enamel was found unaffected. This same tooth, which had withstood the concentrated action of CO_2 saliva solution for thirty days, was then washed in alcohol to remove the grease and was placed in a watery solution of CO_2 ; in twenty-four hours it was badly decalcified, showing conclusively that a watery solution of CO_2 would in twenty-four hours cut an enamel that had withstood a similar saliva solution of CO_2 for thirty days.

These tests have been repeated sufficiently often to convince me that my observations are accurate.

Just as saliva inhibits the action of carbonic acid, it also has an inhibitory effect on many other acids. The 1:500 watery solution of lactic acid, at body temperature, will cut and decalcify tooth enamel in thirty minutes, while a tooth can stay in a 1:500 lactic acid saliva solution without roughness or apparent weakening of the tooth structure for fifteen days. On the other hand, the inhibitory effect of the saliva is overcome when the lactic acid is present to the extent of 1 per cent. in a saliva solution, and the tooth enamel is found to be cut in from one to five minutes—about the same length of time as though a 1 per cent. watery solution of lactic acid had been used. We gather from this that saliva has no positive inhibitory action on such strong solutions of lactic acid; but are such strong solutions of lactic acid found normally in the saliva? A 1:20,000 watery solution of lactic acid in three days has softened the grinding surface of a tooth so as to allow a lancet to cut a smooth shaving from the surface, but the part protected by the enamel cuticle was apparently unharmed. At the end of five days even the cuticle surface could be scratched, showing that a watery solution of lactic acid imperceptible to litmus or any other test might decalcify a tooth and make it an easy vic-

tim to abrasion or attrition. A 1:6 watery solution of lemon-juice equal to about 1 per cent. citric acid will decalcify tooth enamel in ten minutes; at the end of half an hour it causes rough decalcification; while a 1:6 saliva solution of lemon-juice did not cut tooth enamel in two days.

There are many experiments that I have made showing the power of saliva to inhibit the action of acid, and yet where such acid action is inhibited the saliva may sometimes show violent acid reaction to litmus. It is interesting to note that, while saliva will inhibit the action of 1:500 lactic acid or 1:100 citric acid, it seems powerless to do more than slightly retard the action of acid sodium phosphate or strawberry-juice in their decalcifying action on tooth enamel. These tests were as follows:

A molar was cut in halves lengthwise through the root and enamel. Each half was rubber-protected, with small portions of sound enamel and a part of the broken edge exposed. These were placed respectively in 50 ccm. of a 1:2000 and 50 ccm. of a 1:10,000 saliva solution of acid sodium phosphate. A few drops of chloroform were added to the saliva solution to prevent fermentation. These solutions were placed in air-tight jars in the culture oven, at the temperature of 98° F. The enamel in the 1:2000 saliva solution remained smooth and apparently hard during five days; at the end of that time the lancet began to make scratches on the smooth enamel surface. In eight days the broken edges of the enamel were white and distinctly softened, while portions of the enamel covered by the enamel cuticle could be easily carved with the lancet. For eight days the cuticle of the tooth in the saliva solution of 1:10,000 sodium phosphate protected the tooth, but at the end of that time the enamel rods of the broken enamel surface began to show slight but unmistakable signs of decalcification. The saliva used for this test was distinctly alkaline to litmus.

Strawberry tests: A tooth with sound enamel was wetted with a drop of saliva and plunged into a ripe strawberry. At the end of one and a half hours it was withdrawn, washed in running water, and dried with the air-blast. The worn surface of the enamel was decalcified, but the cuticle-protected surface was unharmed. The tooth was then wetted with more saliva and replaced in the

strawberry. At the end of four hours and a half it was examined as before, when both cuticle and worn surface had lost their gloss through decalcification. A single rub with a napkin, however, restored the gloss—to all appearances as bright as before.

This shows how smooth erosion may arise from acid alone aided by the mastication of ordinary food.

Two sound teeth were then selected and incased in rubber tubing as before described, so that only enamel was exposed. These were placed respectively in two solutions, one of half crushed strawberry and water, the other of half strawberry and saliva, with a few drops of chloroform as usual to prevent fermentation. In fifteen hours the enamel of the tooth placed in the watery solution was badly cut; the tooth in the saliva solution was also cut, but not nearly to such a degree, the saliva having somewhat retarded the action. In five days both teeth were so much cut that the enamel of each was mushy. I also found that pure orange-juice in four days made a smooth decalcification of enamel that could be cut with a lancet; in five days white decalcification was visible.

Rhubarb, grape-fruit, and other fruit acids are at present under experimentation, but as I have not had time to make control saliva tests, I hope to report on them later, as well as on the saliva tests of acid calcium phosphate. In these fruit tests I have tried to use acid solutions such as would ordinarily be found in the mouth. Of course, when the acids first enter the mouth they are practically full strength, but ordinarily, with a free flow of saliva, any controlling action will be exerted before material decalcification can occur. Still, during the times when a fruit pulp is bitten into by the teeth, any protecting power of the saliva can exert very little influence, and for that short time the teeth are exposed to the unrestrained action of the undiluted fruit acid.

In summing up my paper, let me re-

iterate that the litmus test is unreliable because it may not detect the presence in the saliva of weak acids that can nevertheless cut the teeth. And on the other hand, even when it demonstrates markedly the presence of acid, such demonstration is of little clinical or scientific value, as the litmus does not reveal in the slightest degree whether the acid indicated is controlled or is in a condition in which it is free to harm the teeth.

Let us further note that the saliva has decided powers of protecting the teeth from acid decalcification that can hardly be explained by its contained alkaline salts. It is possible that this inhibitory action of normal saliva on acids may be temporarily suspended by certain diseases, or that certain fevers, drying the mouth and stopping the flow of saliva, may allow certain acid fermentations to cause decalcification that the presence of saliva in the ordinary amount would have controlled. It is possible that potassium sulfocyanid or some other salts acting catalytically on the saliva may set free the action of acids or acid salts that otherwise would have been controlled. Gout or rheumatism may suspend the controlling action of the saliva over acids, or by letting loose acid phosphate may by this agent attack the teeth, for the saliva I have tested does not seem to be able to inhibit the corroding action of acid sodium phosphate.

In conclusion, it should be noted that the saliva, instead of being the cause of tooth decalcification as some have supposed, seems on the contrary to be a valuable protection to the teeth against the invasion of corroding acids. Investigation along this line is very young, and much more is to be desired, as greater knowledge concerning the ionic action of saliva, as well as its action as a living fluid, will make many problems clear that are yet unsolved.

THE RELATION OF DIET TO INTERSTITIAL GINGIVITIS.

By Dr. C. T. STOCKWELL, Springfield, Mass.

(Read at the annual meeting of the Massachusetts Dental Society, June 5, 1907.)

I HAVE two objects in view in presenting this paper. First, and perhaps foremost, I want to call the attention of this society to the results of certain scientific work along varied but related lines which, for the first time in the world's history, afford something like absolutely scientific data regarding the science of diet. And secondly, to point out the direct bearing this matter has upon the problem of the etiology of interstitial gingivitis. It does not seem too much to say that the day has at last arrived when we may know, really know, something about the antecedents of those varied expressions found in the human mouth which pass under the general term of Riggs' disease. In order, however, that this statement may be made good, it is necessary that we review, with some detail, the new data afforded by modern investigation.

Before doing so, however, let it be said that dentistry performs a noble service for humanity in its double function of preserving the natural teeth and supplying artificial dentures; for so far as good health is concerned, "The teeth are a triumphant gift of provident Mother Nature."

But, in view of what modern science now teaches, our profession is offered an opportunity to do a vastly greater work than heretofore; a mission, in fact, is offered it, worthy the highest human effort. And it seems peculiarly fitting that the dental profession should take its proper place in the ranks of the great mother profession in disseminating this new knowledge with reference to the science of diet; for now, as never before, diet is recognized as the fundamental and controlling factor of the public

health. The *controlling* factor it is said, please note. There are many factors, it is true, in the matter of health. But it is nevertheless coming to be accepted that a proper diet is, fundamentally, the controlling factor. All others are subsidiary.

Now it follows, of course, that if we are to appreciate and improve our opportunity and privilege of having a part in this great mission, we must first acquaint ourselves with the data of modern knowledge. Having this knowledge, we may then proceed, with at least some degree of accuracy, in all our intimate relations with our patients, to impart it, making such special applications as individual cases may indicate. And in so doing we may rest assured that there will accrue to the profession an added dignity, bringing with it more of respect, good will, and gratitude on the part of our patients.

If in the past our work has been unjustly regarded as belonging too exclusively to the realm of the mechanic arts, it has been largely so because we have failed to demonstrate to the world at large that there exists an intimate, immediate, and vital relation between good teeth and good health; and furthermore, that diet, in its nutritive function, is destructively impaired—and this in turn reacts upon the teeth themselves—if the nutritive process be defrauded of the benefit of the proper function of the teeth.

But beyond the range of what has so far been suggested, all of which is more or less commonplace to most of us, there lies a larger field which should concern us as dentists no less than the matters touched upon. *How* a human being should eat his food is surely very important. But what he should eat, how much,

and why, is another matter equally as important.

With the public at large it is not generally known that a revolution is in progress relative to the science of nutrition. In fact, up to the present time the medical world could not boast of a *science* of nutrition at all, especially in reference to the matter of food values and the physiological laws of cell nutrition, to say nothing of the related laws of the transformation of energy.

This revolution is vastly important and significant in its relation to the public health. And when we say that, we touch upon the great matters of the life and happiness as well as the economic efficiency and well-being of humanity at large.

MODERN INVESTIGATIONS ON DIET.

Let us very briefly review some of the main features of modern investigation.

In a purely physiological sense we may say that life is a transformation of energy. The potential energy resident in food substance is transformed by chemical and physiological action into cell energy; and the manifestation of cell energy we denominate life. Life, as you know, is now regarded as universal. There is nothing in all the universe that can be regarded as wholly lifeless. That is to say, the entire universe of matter is reducible to terms of energy in some of its varied forms; and energy is conceived to be only a quality, or one of the qualities, of life.

And so the biologists tell us, "Everything we eat, drink, or breathe is alive; and these things give to us life because they are alive, not dead." But what we term physiological or animal life, as I have said, is brought about as the result of the transformation of energy. Food substances, in the various forms in which we know them, are offered to the cell structures of our bodies by the currents of blood plasma. By the processes of combustion or oxidation of these food substances energy is liberated, and the exhausted cell structure is thereby and

therefrom replenished or maintained from day to day.

What, now, are the food elements best suited to supply the system with the requisite amount of energy, when we take into account the best possible standards or conditions of health? Here is the vital problem; and it is just here where modern science is coming to our aid with its vital answer.

A vast amount of work has been done by the United States Government, during the last ten years, in determining the problem of food values. But further than this, and more important still, various scientific men have been at work along related lines, so that today we have a body of data and tabulated results which compel attention; and this as I have said, is bringing about a revolution, not only regarding the subject of nutrition in general, but also as to the sources of many of the most serious of human ailments.

For a year or two past, reports from these varied sources have begun to appear—here a little and there a little. Papers have appeared in the medical journals to some extent, and more in the physiological journals, relating especially to Folin's physio-chemical work. But to no one source are we so much indebted, probably, as to the investigations carried on for several years past under the direction of Professor Chittenden of Yale College; and his "Physiological Economy in Nutrition," based upon these investigations, would seem to be an epoch-making book. To those, however, of open eyes, the sources of information are numerous. The daily papers, even, are now beginning to give us hints and part pictures of what is going on. For a concise statement of some of the main features I am indebted to reports of a recent meeting of the American Medical Association, and to chemists in the employ of our national government.

THREE MAIN POINTS.

Perhaps I may best summarize these reports by saying that there are three main points upon which emphasis is laid,

two of which are primary, and the third related or subsidiary: First and foremost the proved fact that the carbohydrates—the fats and sugars—are the energy producers in the animal organism, not the proteids, as has been popularly held to be the case. The proteids, of which meat, eggs, cheese, peas, beans, etc., are representative elements, are only needed for the purpose of building up and maintaining the equilibrium of tissues. They are never needed as energy producers. Secondly, overeating, especially of proteid material or nitrogenous elements. Thirdly, insufficient mastication.

Emphasis is placed upon the lack of proper mastication partly for two reasons: First, because of the physiological necessity that food substances, of whatever nature, should be thoroughly masticated, and second, because if one does properly masticate his food, the appetite is found to be well satisfied with about one-half the quantity otherwise called for. Thus one, at least, of the common sources of human ills is avoided quite easily. That is, the physiological necessity of thorough mastication is met, and the ills that follow overeating are at least largely avoided by taking the requisite time to properly masticate our food.

A further fact has also been demonstrated by recent experimentation. By following the rules of thorough mastication and strict adherence to taste-instinct, the desire for meat-consumption almost entirely ceases. The appetite no longer seems to require it. These experiments also show that working power, both physical and mental, is thereby "tremendously increased."

Insufficient mastication and overeating have been preached against for many years, but so far as the general public is concerned, with little or no effect. Democratic Americans pay little attention to mere preaching anyhow, of whatever kind. In this respect we are much like the Japanese, who, when a new religion is presented to them as superior to their own, want to know why it is better, and how the fact can be demonstrated.

This, however, is a strenuous age, an age when energy or working power is at a large premium; and consequently the human family are now seeking, as never before, the sources of physical and mental energy. And so when science, as it can do today, points out the sources of an enlarged personal energy, I predict on the part of the general public a different attitude in the near future. Besides, it is all a part, and a very vital part, of the present general trend, viz, of prevention rather than cure of disease; thus being beneficent in a double sense, as adding greatly both to the economic efficiency and to the happiness of the human race.

I wish it were possible to epitomize, in an intelligent way, Professor Chittenden's great work. No one, however, can gain any adequate idea of the extent and importance of his work, and that of his associates, without a thorough and careful personal study of the book—a study by and for himself.

I said a moment ago that how a human being should eat his food is an exceedingly important matter; but what he should eat, how much, and why, is another and equally important matter. Professor Chittenden's book answers these vital questions. It shows how a marked increase of both physical and mental efficiency may be acquired. How a host of the most distressing and fatal ills of our modern life may be avoided. It demonstrates that the older data and tables relative to the physiological requirements of the human system are based upon false and unscientific conceptions. It points out the true function of various elements of food substances. And it may now be said, as the result of his work, reinforced by the investigations of many other men along allied lines, that the real function of the proteid elements of our food supply is to build up and maintain the bodily weight; and that we depend upon the carbohydrates, or the fats and sugars, for our working energy. Furthermore, we now know that the mature human organism will appropriate from the proteid supply only what it needs—or approximately what it needs—to maintain the normal

bodily weight. Consequently, the over-supply of these elements becomes a tax and burden upon the eliminating organs, which sooner or later are sure to suffer. Hence auto-intoxication takes place, and faulty elimination soon follows, of both of which we have heard much during the past few years.

Another point is involved here which should not be overlooked. Note the utter waste of energy that is expended in this process of eliminating the surplus proteids. They are of no earthly use in the economy of the animal organism. Indeed, they are far worse than useless. Human efficiency, in both its physical and mental aspects, is greatly handicapped thereby. All the work and play of the world depend upon the margin of energy beyond the amount required to maintain the organism in normal equilibrium, or in good working order. This surplus or margin of energy beyond the physiological necessities of the organism the psychologists call *euphoria*. *Euphoria*, then, is the all-important matter in the world's store of economic efficiency. And if a considerable portion thereof is expended in the task of eliminating the non-appropriated proteid material which we put into the system, it is certainly an economic waste of energy, and greatly hampers the efficiency of the human race.

I wish to make this point relative to the over-supply of the proteid elements of diet definite and clear. It seems to me vastly important. Let us get our minds fixed once for all, and firmly, upon this proteid over-supply beyond the needs of the human system in its at least approximately determined equilibrium. Their name is "devil"; and most of us are possessed. Let us eliminate this demon, and in his place substitute life and life's achieving energy.

EXPERIMENTS IN DIET WITH ATHLETES AND PROFESSIONAL MEN.

Something might well be said here, did time permit, relative to the results of Professor Fisher's endurance tests,

by which he finds that a non-flesh diet is more conducive to endurance than a flesh diet. He had forty-nine subjects, divided into three divisions. The first class consisted of the Yale athletes accustomed to a full flesh diet. The second class were Yale athletes accustomed to a non-flesh diet. In the third class were medical men and others of sedentary habits accustomed to practically a non-flesh diet. Invariably the non-flesh-eaters, or those that were practically non-flesh-eaters, won in all the varied tests. Let one test, selected from the large number, illustrate the rest. It was between a track athlete who was a meat-eater, and a Yale professor who had adopted the abstemious diet prescribed by Professor Chittenden. "The trial between the two was in the arm contest. When the athlete had held his arms in position eight minutes, they began to tremble, and a minute later they began to fall, while he battled to hold them up. While he was succumbing to the strain his antagonist was holding his arms as straight as when the two started out, and he continued to hold them in position for thirty-seven minutes"—winning, as you see, by nearly one-half hour.

Of a large amount of matter at hand, I will further cite here the statement of only one other scientific expert, then pass on to the application which I propose for your consideration.

Dr. Wiley, the chief of the bureau of chemistry in the agricultural department of the United States, before a legislative hearing, is reported as follows:

"Lots of people are vegetarians. We eat too much meat for health. I have voluntarily cut down my meat to one meal a day, and I do not eat very much at that. For the sustenance of physical exertion, if you have hard work to do, there is nothing better than starch or sugar. The cereal-eating nations can endure more physical toil than the meat-eating nations. This is not the accepted view, but it is true. You cannot tire out a Jap who eats rice. He will draw you all round the town on a pound of rice, and be as fresh at the close of the day

as when he started. You could not do that on a pound of meat to save your life.

"There is much more energy for exertion in starch than meat, but by a diet containing too much starch in proportion you starve the muscles and other protein parts of the body. The ration which a man naturally chooses is one part of protein to six and one-half of starch and fat; and that is the best ration for man. He gets his protein in the wheat, beans, peas, and meat; his fat in butter and fat meat, and his carbohydrates in starch, sugar, lean meat, and butter. I do not think any of them tend to produce disease except when long continued."

These are at least suggestive words when we consider that they come from the official head of our national experiment stations—a department engaged, for many years past, on the problem of food values; and as will be seen, they accord very fully with results cited from other sources along allied lines.

RELATION TO DENTISTRY OF MODERN KNOWLEDGE OF FOOD VALUES.

What, now, is the special application of this modern knowledge to our work as dentists? If I am not greatly mistaken there is a wide field for its careful consideration in our specialty.

To those who for some years past have followed the investigations of Dr. Eugene S. Talbot of Chicago, and have given due attention to the papers he published in the issues of *Items of Interest* for November and December 1906, it will at once be seen that there is an immediate and intimate relationship, so far as results are concerned, throughout the whole group or series of these modern investigations. The constitutional sources of interstitial gingivitis Dr. Talbot traces to auto-intoxication; and holds that no radical cure can be expected short of the correction of those constitutional conditions which result in auto-intoxication. And, as we have seen, a large, if not the controlling element

in auto-intoxication depends primarily upon a wrong system of diet—in other words, upon an over-use of proteid material in the food supply.

Dr. Talbot in his therapeutics does not go into this matter as it seems to me he might and ought to have done. Thus far, at least as far as published reports go, he deals almost exclusively with elimination, faulty and otherwise. This is surely well, as far as it goes. But the time has come when he should take the next logical step—or at least we may do so, and teach our patients to avoid loading up their systems with material which so vitally needs to be eliminated. If our patients can be induced to do this, we shall hear less said in diagnosis about faulty elimination, and we shall also serve them more worthily along the lines of scientific prophylaxis.

I have always believed, and now more strongly than ever before, that external local conditions cannot be held solely responsible for those varied expressions classed under the general term of "Riggs' disease." My clinical experience and observation for twenty-five years teaches me this; and for many years I have given special attention to this feature of human ills.

Further than this I am now convinced that no such disease exists as "pyorrhea alveolaris." I believe Dr. Talbot is wholly right in claiming that the disease in question is interstitial gingivitis, and that all the conditions following its initiation should be classed as results or expressions thereof, not as the disease itself with which we have to deal.

But it may be said—as has already been said—Is not the presence of pus a sure sign of disease? "You all know," says Dr. Talbot, "that you cannot have pus infection in any part of the body without an inflammation. Treat your inflammation, and the pus will take care of itself. . . . Treat your interstitial gingivitis and let your pus alone." He means, of course, that without the initiative action of the elements of auto-intoxication there would be no inflammation, and consequently no pus, or that

pathologic condition which we have been taught to name *pyorrhea alveolaris*. And in treating the pus pockets simply, we are beginning at the wrong end of the disease, merely lopping off the symptoms and nothing more.

To my mind he is entirely right in this position. It is the inflammation, not the pus, that directly concerns us in our treatment of these cases. But, in the light of the investigations referred to in the first part of this paper, even Dr. Talbot, in dealing simply with the problem of elimination, has not taken hold of the positively right end of the disease. "Treat your inflammation," he says, "and the pus will take care of itself." Let us go one step farther, and treat successfully our auto-intoxication. We will then get a step nearer the right end of the real disease, especially so if we cut out from the human system the material upon which so large a proportion of auto-intoxication depends.

Do not misunderstand the position taken here, either by Dr. Talbot or myself. All local irritants that may be found about the teeth should of course be removed. In other words, the teeth should be thoroughly cleansed. But by so doing do not consider that the real disease or the specific inflammation involved is being treated. A deeper problem than local irritants is involved in cases that can properly be called interstitial gingivitis. Local irritants are numerous enough, surely; but these alone cause simply an irritation of the gums and the gingival border of the alveolar process, and recovery speedily follows the removal of the irritant. These, however, do not constitute our discouraging, persistent, almost hopeless cases. Something more is involved in the etiology of the latter. What is it?

I believe Dr. Talbot is entirely right when he terms it interstitial gingivitis or deep-seated inflammation in the alveolar process, due, mainly to auto-intoxication; or, in other words, due to the toxic products circulating in the blood currents. And in the light of modern investigation we may now conclude—

may know, in fact—that this auto-intoxication is at least largely due to the over-use of the proteid elements of the food supply.

Overeating in itself is undoubtedly involved as a cause, whatever one may eat; but if there be an over-use of the carbohydrates simply, the system is taxed far less seriously in getting rid of the excess, the surplus being largely converted into certain forms of gas, and thus easily eliminated. But with the proteid surplus the facts are entirely different. The mature human being will appropriate only about two ounces of proteid material per day. Most of us take into our systems a much larger quantity than that. This non-appropriated surplus must be eliminated somehow, and as a natural result, the lungs, skin, bowels, and kidneys are, in any case, vastly overworked. Sooner or later the vital forces are weakened, function becomes faulty, putrefactive fermentation takes place, poisonous elements are evolved, the blood currents are loaded with the agents of irritation, and a condition exists which is well termed auto-intoxication.

What follows? Naturally and inevitably there follows a train of pathologic conditions leading, first of all, quite likely, to interstitial gingivitis; for the peculiar structure and surrounding conditions of the alveolar process make this tissue the most vulnerable point of attack.

Thence, if not arrested, the various forms of rheumatism, gout, Bright's disease, etc., may reasonably be expected to appear in due and characteristic form. I presume that many of you, like myself, have seen some, if not many, of these typical cases of so-called *pyorrhea alveolaris* gradually progress in the course of years to that stage where the gouty forms of rheumatism and Bright's disease were clearly apparent; and this condition has come about in spite of all you or anyone else did, or could do, to prevent it by merely external treatment. We began at the wrong end of the disease. We failed to get back of the pus pockets with our methods of relief.

And here, as Dr. Talbot has not failed to point out, the well-informed dentist may do the patient and the family physician a great service by calling the physician's attention to the early stages of a systemic condition which, if neglected, will lead ultimately to a conflagration.

It is well to bear in mind, in this connection, that according to the laws of development, the alveolar process is exceedingly sensitive to the influence of inflammatory disease. The bloodvessels extending through this tissue are conducted in a tortuous manner, thus interfering with the return circulation. It is, as Dr. Talbot shows, an "end organ," an organ through the structure of which the blood passes and is restricted in its return. Hence disease or changes in nutrition more readily take place.

Let the blood currents, then, become loaded with an irritating, poisonous agent—"stasis may very easily result and the arterial walls become diseased." A degenerative process or retrograde metamorphosis is established, which means the sure destruction and loss of tissue if not speedily and effectively checked. And surely the rationally fundamental way to check this trouble is to correct, not faulty elimination, but rather the faulty habits of diet. In so doing the various organs of elimination and their functions will readily take care of themselves.

Dr. Talbot, in his suggestions as to the treatment of interstitial gingivitis, puts the emphasis upon aiding Nature in her eliminating processes. This is well as regards the sources of immediate relief. But, in the light of such scientific facts as I have tried to present, for permanent relief we must go a step farther; we must seek not only to relieve, but we must protect the system from the irritative

agents which result in auto-intoxication. And here we find ourselves confronted with the inevitable fact of an over-supply of the proteids in the food material.

CONCLUSIONS.

Here, it seems to me, we have a new opportunity opening before us—a new era glimpsing the future. Let us be as conscientious and thorough as ever along the lines pointed out by Dr. Smith and others. Absolute cleanliness and massage of the gums are still the ideals in external treatment. But although this be done as faithfully and as well as is possible, there still remains a latent, submerged fire which, in many cases at least, is not reached. We must go deeper. We must banish the material upon which it feeds.

It follows, then, that in the excess of the proteid elements of our food supply beyond the demands of the system in maintaining itself in good working order, we find a prolific source of auto-intoxication, together with its long train of human ills, including interstitial gingivitis. This being true, the course of therapeutics is both plain and simple.

Many of our scientific men are saying today that more real harm comes to the human family from intemperate eating than from intemperate drinking; and modern science shows how this may well be so. Our bodies are but the machinery of our souls, and we get out of them essentially what we put into them.

It was said of a certain man that he lived very much in his head. Of others it may be said that they live in their hearts; while of too many of us the stomach seems to be the chief place of abode. There is a difference! The finer, purer, sweeter airs of life and health are higher up.

WANTED!—A PATHOLOGICAL SENSE.

By JAMES TRUMAN, D.D.S., Philadelphia, Pa.

(Read before the Northeastern Dental Association, at its annual meeting, Boston, Mass., October 17, 1906.)

THE average practitioner would naturally consider this sense a superfluous want in dentistry. The lowest man in the dental college class is supposed to have a knowledge of the importance of pathology in connection with his specialty. While this is true, the man with a clear pathological intuition is seemingly a rare production in our ranks, if we are to judge by the serious mistakes presented in almost every line of dental operations.

To observe the average practitioner at work it would seem as though the great effort was to gain time for other operations and to get rid of the patient as quickly as possible, regardless of the pathological sequelæ that may result.

The operative man intent on finishing his fillings has no thought of the many things that might happen to his patient as the result of his excavating and drilling. The "extension for prevention" absurdity has taken such a deep hold on some minds that they will proceed to cut a pinhead cavity to the limit of the boundary of the approximal surface, and then, not satisfied, will begin to remove about half the sulci of the occlusal surface. They have no memory for the histological fact that they are removing a large portion of the enamel shield and substituting therefor a metal conductor, irritating through thermal shocks the cut ends of the protoplasmic contents of the tubes, and inviting thereby subsequent irritation and ultimately congestion of the pulp, possibly. The patient complains of pain on taking hot and cold drinks, but the soothing answer comes that it will soon quiet down, and it does, but in the majority of cases the

quiet means that the pulp has died. Have operators the privilege of thus abusing and deceiving patients?

Again, under the same dictum from high authority the operator will cut away the cervical border of the tooth, removing all the remaining enamel, tearing away the peridental membrane, all the cementum, and forming a cavity in the dentin. He has accomplished two processes of disturbance here: one, the irritation of the peridental membrane, inviting bacterial invasion; and the other, irritation from the metal in contact with the peripheral ends of the dentinal tubes. There still remains a third: he has created a pocket for the collection of organic matter, the development of pathogenic bacteria, and eventually the possibility of pyorrheal conditions and recession of the gingivæ. Is this the best work dentistry can perform in this the twentieth century?

The cry has gone out, "The pulp is no longer of any value in the conservation of the tooth," and right and left, men are destroying pulps in healthy teeth under various pretexts. The man who teaches that the pulp has lost its function from old age—which may not be defined by years—is not educated to the standard of the modern dental curriculum. The loss of the pulp means the death of two-thirds of the tooth. The remaining third may be made up of the enamel—which in my opinion loses its slight remaining hold on vitality by the loss of its nervous connections—and the cement, the latter being constrained to contend with dead bone (dentin) on the one side, and an overworked membrane, from which it receives its nutrition, on the other. Eventually in after years the

tooth gradually becomes unable to resist environmental influences, and rapidly degenerates and disappears. The dentist then congratulates himself that years have supervened since he operated, and it is therefore no fault of his that that tooth has gone the way of all humanity.

Then the "bridge worker" begins when the operative dentist has completed his work. He must have an abutment, or two of them, but as two are not always available, one must subserve his purpose. If it be a bicuspid, he makes a peg of it and then crowns it with gold. He may or may not have devitalized the pulp (he will call it the "nerve"), but that is immaterial, as he is indifferent to any immediate suffering of the patient. If it be a molar in the lower jaw, he has learned by experience that the grinding off of the enamel means eventually the death of the pulp, so that organ is at once devitalized. He then undertakes to make it good by removing the dead pulp. He cannot do this effectively in the anterior canals, so consoles himself with the reflection that it will be a long time before abscess sets in, and a "bad cold" will, in any event, cover his sin of omission and commission.

I have in view one case in which a lady sought my advice in regard to a bridge on the lower jaw, to be attached to a canine. It was demonstrated to be impossible. If it ever was attempted it would result in serious pathological disturbance. At my suggestion she consulted one of the best bridge workers in the United States, and he confirmed the view given. She, however, went to another; the bridge was made and for a year or more it remained comfortable; then began very serious pathological trouble, medical attendance, great suffering, and final loss of the bridge. Is this an unusual type?

The cry has gone abroad, "Shall it be whole bands or half-bands?" A few even will be heard insisting on no bands. Nature is very kind, and will permit average ignorance to meddle at will with the tissues of the body. No other reason will explain the occasional tolerance per-

mitted in the case of bands and half-bands. By all the laws of which we have any knowledge a band should sooner or later cause the destruction of the periodontal membrane. For reasons already alluded to, on cutting below the cervical border there is every opportunity here given for the development of pathogenic bacteria with their irritating toxins, with the result that an artificial pyorrheal pocket is established. It is only a question of time, in my opinion, when all teeth so treated will be lost. It is therefore not a question of whole bands or half-bands, but *all* bands should be relegated to the scrap-heap.

It may be a subject for inquiry whether the average dentist ever considers his patient when he rams the clamp down on the periodontal membrane; or whether he ever takes a thought of how it feels when he gives an extra twist to the ligature. Neither does he regard the effect of time—as to what, after a couple of hours of torture, may be the subsequent result. He forgets that he may have started a pathological border upon that tooth eventually to end in its destruction. How many, may it be asked, take the precaution to use antiseptic measures after each operation? The answer must be left to the conscience of each individual. The dental world of 1850 knew very little of periodontal lesions, certainly not from clamps, ligatures, separators, etc.

The Editor of the DENTAL COSMOS, in an editorial article (July 1906) in quoting the writer of this essay in regard to the latter having contended, in a previous article, that the good men of 1850 taught the same methods in shaping cavities as the modern exponents of "extension for prevention," goes on to explain the difference—viz, that "The good men of 1850 may have known how to shape and fill cavities, but the good men of today know why, and the difference between the how and the why, in this case at least, is just the difference between empiricism and science."

The Editor would find few to object to this, but if the good men of 1906

know not only the how but the why, then the majority in the dental profession in this twentieth century are to be condemned, and all, including the Editor of the DENTAL COSMOS, if he practices as he preaches, are to be ranked with those who, having received the light of the new dispensation, prefer to walk in paths that lead physiologically and pathologically to the injury of patients and to the discredit of the dental profession.

In five minutes it is impossible to enumerate all the possible lesions that the dentist may and does produce. It seems to the writer to be time to sound the note of warning, and plead for a

broader intelligence in all that concerns the entire human organism. Partial culture in dentistry is a thing of the past, or should be, but with thoroughness must be inculcated a power to think. I repeat, therefore, that what is most demanded in dentistry today is not a higher entrance qualification or a broader curriculum, but an ability to grasp the essentials of disease, to follow from cause to effect—in other words, to cultivate a pathological sense that may enable the operator to mentally grasp with clear prescience the results that may follow all the operations we are called upon to perform, and the influence that these may exert upon the entire organism.

PLATINUM MATRICES AND PURE GOLD IN INLAY WORK.

By SAMUEL H. McAFEE, D.D.S., New Orleans, La.

(Paper and clinic presented before the Mississippi Dental Society, at Meridian, Miss., May 29, 1907.)

THE subject of gold inlays is now attracting more attention, perhaps, than any other before the profession, and with its further development and perfection, together with that of porcelain fillings, we will be on the verge of a new era in operative procedure. The cemented-in filling is, even now, marking the passing of extensive cohesive and non-cohesive gold and amalgam operations, and has greatly lessened the need of crowns.

A great deal has been written on the subject and many methods have been put forward, and from the fact that I have heard little or nothing about the use of pure gold and platinum matrices I am led to believe that this method is sufficiently uncommon to warrant a brief description, with the hope that it will prove of at least passing interest.

The superiority of a melted pure gold solid inlay compared with one made of gold solder is, I think, unquestionable;

but as much of excellence and beauty lies in the case of technique and positiveness of results as in the finished operation.

I have not been able to make cast gold fillings of solder that did not show pits and imperfections. This is specially true of the more extensive or complex fillings in which "boxing" and investing are necessary. The pits and imperfections in the flowing of the solder are of course due largely to the incorporation of flux or borax and oxids in the mass of solder. Whenever an investment is necessary it is impracticable to stop the soldering operation and cleanse the piece in acid, and before the filling is built up you have a mass of borax, solder, and oxid, with the frequent result that the solder fails to melt down solidly and run perfectly into the deep portions. Where a platinum matrix is used and the body of the filling is made with 24-karat gold no oxidation takes place, therefore

no flux or borax is necessary; the pure gold will melt down solidly and run sharply into the fine lines and well out to the marginal edges. The result is a *solid pure gold inlay*.

Some operators object to platinum as a material for making matrices on the ground that it is harsh and intractable. I find it no more difficult to make platinum matrices from 1/500 in. rolled platinum, properly annealed, than to make them of gold. The somewhat greater rigidity of the platinum matrix as compared with gold I find a help rather than a disadvantage in making a perfect fit. It will not warp or change shape with the slightest touch, and it can be manipulated beyond the investment stage with safety, and there is practically no danger of melting it. In simpler cases no investment is necessary and the matrix may be laid on a soldering block and filled. This method of making pure gold inlays with platinum matrices is the same in general principles as that used in any matrix-solder method. Some of the details may be stated as follows:

The cavity is given the usual "inlay" preparation. A model of the cavity with which to begin the matrix greatly facilitates the operation. A small impression tray is made by bending into the figure of L or U, as the case may require, a suitable piece of some thin metal—No. 30 gage aluminum being good for the purpose. Place the proper quantity of impression material (lac or modeling compound) in the tray, being careful to avoid great excess. Soften with dry heat; have the cavity wet with saliva; carry the tray into position with the dressing pliers and push it up with the points; hold it steadily, and then chill it with a jet of cold water. Do not push the surplus compound down around the tooth; doing so will only interfere with the withdrawal of the impression. Fill the impression with quick-setting zinc oxychlorid cement. The advantage of oxychlorid for this purpose is that it is not sticky, like the phosphate cements, and can be worked perfectly into the sharp lines of the impression. Sufficient

time must be allowed for the cement to harden perfectly. The S. S. White Dental Mfg. Co. have recently gotten out a preparation called "inlay metal" which fuses at so low a temperature that it can be poured into a dental lac impression. This may be used to advantage where expedition is necessary. An impression and cast of the cavity saves time in the end and tends toward a better result in all extensive cases—those in which cast fillings are really indicated.

Impression and cavity model are carefully separated and the latter is now seated in modeling compound in the swaging-press base, or if the press be not used, seat it in a small block of modeling compound to facilitate handling. Rolled platinum plate (not thin foil) of 1/500 in. thickness, thoroughly annealed, preferably in the electric oven, is best for the matrix. A piece of proper size should be worked into the cavity model with the aid of ball burnishers and spunk, care and frequent annealing being necessary. If a tear in the bottom occurs it does not matter specially: work in a small piece over it and tack it down with a minute piece of pure gold. It is now swaged in the water-bag press. This press is not absolutely essential, but it greatly facilitates the making of the matrix. The matrix, however, can be worked in with burnishers with sufficient accuracy to bring it to the final burnishing in the cavity. I have not enough faith in the accuracy of an impression to finish a filling without giving the matrix a final burnishing in the cavity itself. The bottom of the matrix should now be thickened with 24-karat gold. To do this, paint the back of the matrix and around the marginal edges with a paste composed of chalk and rouge in equal parts, saturated with alcohol. This will keep the gold from flowing out to the margin or on the back, so that the final burnishing of the margin may be done. Lay the matrix on a piece of charcoal and melt enough pure gold in the bottom to stiffen it. Give it the final burnishing in the cavity. Trim the edges of the matrix close to the margin; have scarcely any marginal lap.

The inlay should fit at the margin of the cavity, not at the overlapping edge of the matrix, and the matrix is more perfectly and comprehensively burnished with little or no overlapping surplus to confuse the vision and interfere with the insertion and removal of the matrix. Pure gold will run sharply and clearly to the very edge of a platinum matrix, and not over it if the chalk-rouge paste be properly applied. The final burnishing finished, the approximal contour of the filling is built out with wax in the usual manner. A piece of thin platinum foil is lightly burnished over the wax and tacked on with a warm spatula, the surplus foil being trimmed off with sharp scissors after it is tacked on. It should then be tried in the cavity to be sure of the proper contour. If no previous separation of the teeth has been obtained—it is very rarely necessary in this class of work—care should be taken to let this platinum foil boxing be a little full at the approximal contact, as the foil must subsequently be polished off.

Next paint the outer surfaces with the chalk-rouge paste; invest, allow the wax to burn out, and melt in pure gold to the proper fulness, using no borax or flux of any kind. If gold scraps be used they should be first melted into small pellets and boiled in acid. Pure gold plate costs only a few cents per dwt. more than solder, so the additional cost is nothing to consider. Even in extensive inlays the cost of the gold would rarely exceed that of a gold crown or any other gold operation.

The approximal surface is trimmed down to remove the platinum foil and is given the proper approximal contact. The correct occlusion is easily obtained in the mouth, as the pure gold may be readily trimmed out with appropriate grinding stones. I have found this more satisfactory and quicker than trying to make the occlusion by a swaged piece. I use vulcarbo wheels and points for this purpose, and give the final finish with fine disks on the engine, much of it being done after the inlay is set. Large inlays should be grooved to augment the anchorage; in fact, much of the gold

on the cavity side may be drilled out, thus saving some gold and affording additional strength of anchorage in the cementation.

Slight faults in the marginal adaptation may often be improved by holding the inlay firmly in the cavity and going over it at that point with a small serrated plugger in the automatic mallet; the pure gold, being malleable, will slightly swage under the plugger and become closely adapted to the cavity margin—provided, of course, that the point at fault be accessible.

After much experimentation with the various solder processes, this method seems to me the easiest and best, and in the end productive of a larger percentage of positive results—time, labor, and fineness being carefully considered.

I have tried the moss fiber or sponge gold method. In my opinion it presents the same disadvantage as solder, for if the solder does not flow perfectly throughout the mass of moss fiber gold the deep portion of the filling may be easily pulled to pieces. If it be pickled in acid to remove the borax and oxid it is doubtful whether the acid that penetrates the more or less porous mass is ever completely neutralized; or if you neutralize the acid with an alkali, some of the latter will probably remain unneutralized—either of which conditions is disastrous to the cement. Such an inlay, pickled in acid and dropped in an alkaline solution, will produce effervescence for a much longer time than might be supposed by anyone who has never tried it.

Many of the failures of cemented fillings or inlays are due to indifference in the operation of cementation. One of the advantages of large inlay restorations, as compared with crowns, is that the rubber dam may be applied, the tooth thoroughly dried and kept dry until the cement has thoroughly crystallized. A slow-setting cement is always preferable. The method of cementation which I use for all inlays, porcelain and gold, is as I will now describe:

Apply the rubber dam, thoroughly

cleanse the cavity; make such undercuts as may be had without endangering the strength of the tooth; apply slow-setting Harvard cement, rubbing it thoroughly into the cavity with a ball burnisher, and on the cavity side of the filling; carry the filling to place, manipulating it with pointed instruments to be sure that it is perfectly seated, and al-

low it to remain under the rubber dam for forty-five minutes.

It is to be hoped that the new process of casting pure gold inlays without the use of matrices, brought forward by Dr. Taggart, will soon become a practical reality, and that the technique will present no difficulties greater or as great as in matrix methods.

A CORRECTED CASE OF PRONOUNCED MALOCCLUSION OF THE DECIDUOUS TEETH.

By GUILHERMENA P. MENDELL, D.D.S., Minneapolis, Minn.

EARLY in December 1904 the little patient shown in Fig. 1 was brought to me. He was then two months under four years old, and as is shown in Figs. 2 and 3, he had a fully developed case of malocclusion in class II, division 1 (Angle classification).

The etiology of the case—mouth-breathing—was easily determined from an examination of the nose and throat, and from the history of the child's health given by the mother. The rhinologist who examined the case discovered small adenoids, but as there was little or no stenosis of the air-passages, and the child was breathing normally at the time, we decided that there was no need of surgical interference. That the adenoids had been very large and the child a mouth-breather was unmistakable from the account the mother—a woman of unusually good sense—gave of symptoms and illnesses during his early boyhood.

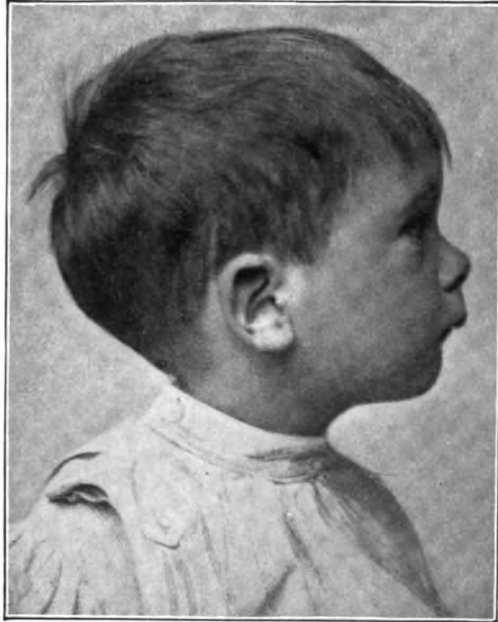
I am more and more impressed with the fact that pathological conditions of the nose and throat—but of the nose especially—are the primary cause of most cases of malocclusion. We know adenoids occur in very young children—babes three months old—and I am beginning to question whether the disturbances of health during teething are not often greatly aggravated by some such cause.

Only a few days ago a mother told me of her little daughter—now a healthy girl of ten—who when a baby had had convulsion after convulsion; how they had consulted first one physician and then another, until finally a rhinologist discovered that the child had adenoids and told the mother that they were undoubtedly the cause of the convulsions. So it proved, for upon the removal of the adenoids the convulsions ceased, "and," added the mother, "at that time we were owing ten physicians who had treated the case."

But to return to the teeth of my little four-year-old. This was the first case of malocclusion of the deciduous teeth I had seen, and as at that time I thought such cases were very rare, I decided at once that I must have a model of the teeth. To obtain a wax impression would have been comparatively simple, but to one in the habit of taking impressions in plaster the idea of using any kind of plastic material for an impression was abhorrent, so rather quakingly I made the attempt to get a plaster impression. To my great delight the little boy made almost no protest, until, having obtained the impression of the upper teeth, I undertook to get one of the lower. Feeling, I suppose, that he was being imposed upon, he refused to let

me go on; but a little judicious praise of his former manliness soon made him beginning treatment (of malocclusion) early, just as soon as the appearance of

FIG. 1.



willing to go through the ordeal a second time.

irregularities is manifest, and the teeth have emerged from the gum sufficiently

FIG. 2.

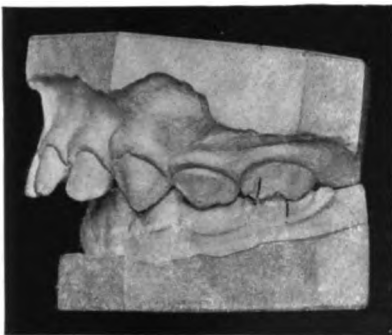
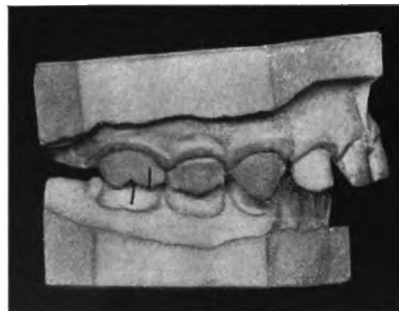


FIG. 3.



The models made, the next question that arose was, Ought the case to be corrected? Dr. Angle, while not specifying deciduous teeth, had been writing for years that he was "more and more impressed with the great advantages of

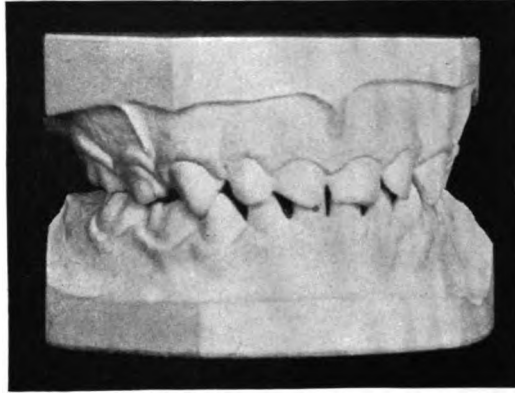
to admit of banding." I therefore decided to send my models to him and get his advice.

In reply to my questions he wrote: "There is no question about the principle as to time of treatment—the earlier

the better. If you could treat this case now, placing the teeth in normal occlusion, you would start Nature along the

and 5 showing the corrected occlusion, and Fig. 6 showing the profile of the face after treatment.

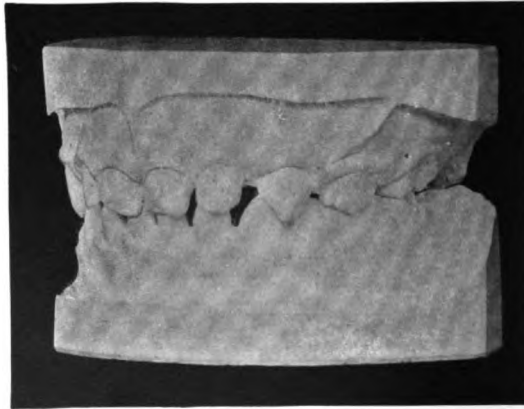
FIG. 4.



right lines, and she would have the advantage of this extra time in molding the bones, muscles, and facial lines accord-

I treated the case in exactly the same way that I would have done had the teeth been permanent teeth. Dr. Angle's

FIG. 5.



ing to normal occlusion, and the permanent teeth would lock normally. So it all resolves itself into—Can you handle the patient at this age? If so, begin.”

So I began, and the successful issue of my attempt is vouched for by Figs. 4

small D bands were adjusted to the four second deciduous molars; the E plain arches were used both above and below, sheath hooks being attached to the arch above opposite the lateral incisors, from which small rubber ligatures

were stretched to the ends of the tubes on the D bands below.* I had no difficulty in adjusting the appliances, and the little fellow wore them with apparently no discomfort. Instead of the sensitiveness and embarrassment older patients often feel because of the more or less conspicuous character of the appli-

labial surfaces of the upper central incisors, but the little boy did not wear it very well, so I readjusted the regulating appliances, which I had him wear for two months more. At the end of that time all fixtures were removed from the teeth.

I have kept close watch of the case

FIG. 6.



ances, he swelled with pride, and felt a glorious superiority over his envious playmates.

The treatment was begun the latter part of February 1905 and as I left the case largely to the mother's care—viz, the changing of the rubber ligatures—it progressed more slowly than was necessary, but by the first of June 1905 it was ready for retention. I first tried a plate carrying a bar made to rest against the

ever since, and find that the teeth are keeping the corrected position perfectly. The lower first permanent molars are only just erupting, none of the permanent incisors having erupted as yet. When all of the first molars and the central incisors above and below have erupted, I shall take pleasure in making a further report of the case.

No comments on the philosophy of treating this case at his age are necessary. An intelligent examination of the models must convince anyone that malocclusion of the permanent teeth would

* All as described by Dr. Angle in the *DENTAL COSMOS* for March 1903.

be absolutely sure to follow if the deciduous teeth had not been reduced to normal occlusion at this time. And surely the wisdom in that time-honored axiom—"An ounce of prevention is worth a pound of cure"—is as clear in its application to the early treatment of malocclusion as anywhere else.

The ease with which very young patients can be handled if a little thought be exercised in the study of their individual natures so that they may be

appealed to effectively, together with the simplicity of operations upon the deciduous teeth, and most of all the ease of retention in such cases, make these little patients the most to be desired, as Dr. Angle has often pointed out. When practitioners of orthodontia shall realize this, the practice of this most fascinating specialty of medical science will bring to them that sense of happiness which work successfully performed alone can bring.

THE BLUE RAY IN THERAPEUTIC DENTISTRY.

By **WALTER JESSE HODSON, D.D.S., Brownwood, Texas.**

(Read before the Texas State Dental Association, San Antonio, June 14, 1907.)

IN approaching this subject I realize that although it is yet in its infancy, I shall find it difficult to set before you any facts not already known to you; not that the subject has been so exhaustively treated, but rather that the facts regarding it are so meager. I have therefore attempted to work along the following lines:

First, to tell you what I have accomplished with this agent in my own practice, believing that actual results are of more value than theory.

Second, to bring to my aid the opinions of the men who, in the scientific world, have gone most deeply into the subject and have written most extensively concerning it. Among those to whom I am deeply indebted in this respect might be mentioned Dr. Edward C. Kirk of Philadelphia and Dr. Prof. Redard of Geneva, Switzerland, both of whom have favored me with their personal opinion; also the one who in our own state stands pre-eminent on this subject—Dr. Pitt S. Turner of Belton.

Being but a beginner in the study of this wonderful agent, I have not presumed to intrude upon you any of my

theories in their present half-formed, chaotic condition.

THREE CASES.

How did I happen to begin experimenting in this matter? One day I became deeply interested in reading an article in a dental journal upon the blue ray and its effects, and looked up various references to other writings upon the same subject. That, however, might have resulted in nothing definite, but on the very same day there was brought to me a case indicating the use of these rays, as follows:

A seven-year-old boy with the lower right first molar, filled one and one-half years before, badly abscessed, and so painful that the child had not slept for three nights. It was very sensitive to percussion; in fact, all the indications of an acute abscess were present. Making an appointment for a later hour, I set about devising an apparatus for using the ray. Needless to say, that apparatus was crude; the results, however, were noteworthy. After thirty minutes' exposure to the blue ray the tooth could be tapped

sharply without pain; the ache was entirely gone, and the swelling completely reduced. The patient enjoyed an uninterrupted night's rest, and the next morning I removed the old filling and cleaned out the tooth. Here I had a second demonstration of the efficacy of the blue ray. In cleaning the putrescent canals a particle of the cleansing agent apparently found its way through the apical foramen, causing excessive pain. Thirty seconds' exposure to blue light brought complete relief, and the filling was completed without further inconvenience.

A second case: A young lady of sixteen; upper right lateral, cavity in palatal pit; advanced abscess; surrounding tissues badly congested, intolerant of percussion, and aching. Immediately on application of the blue ray to the tooth and surrounding tissue, blood and pus began to exude from between the gum and the tooth. (This action is, in my experience, peculiar to this one case.) After an exposure of twenty-seven minutes the tooth was sterilized, dried, and filled to the apex without inconvenience to the patient.

A third case (one typical of the majority of those I have treated): Tooth sore, elongated, and aching; face swollen, tissues congested and rigid. After thirty minutes' treatment, swelling, pain, soreness, and rigidity are found to have entirely disappeared.

I notice that the Program Committee, in first printing their program in the dental journals, called my paper "The Blue Ray and Its Effects." In choosing these words they builded better than they knew. When I began to consider writing upon the subject of the blue ray I sought to gain some information upon the scientific side of the matter—as to *why* it had this action. I consulted those, both in America and Europe, who would be most likely to know, but the result was ever the same, various theories being advanced, from hypnotism to vibration, but all were compelled to say that they did not know the definite cause. I therefore repeat that the committee

chose wisely when they called this paper by the above title, for while we are permitted today to know much of the effects of this wonderful therapeutic agent, it yet remains for some scientist to go deeper and find out *why* these effects.

On this point Dr. Edward C. Kirk says: "Personally I am strongly inclined to believe that the whole scheme is nothing more than a process or device for producing hypnotic analgesia. . . . I believe the method to be valuable only in so far as it is capable of influencing the mind of the patient. I do not believe that the light itself has anything whatever to do with the success of the operation, other than that it is a subdued form of light, and tends to bring about a drowsy condition because of its lack of stimulating effect upon the optic nerve endings."

It is of interest to note that in contrast to this statement Dr. Redard takes issue squarely with him on every point stated. As to hypnotism Dr. Redard states: "This effect cannot be the result of hypnotic suggestion, for if it were, why am I not able to produce the same effects with the red or amber lights?"

SPECIFIC ACTION OF COLORS.

As to the specific action of the various colored lights, there is much that is worthy of note. In the sun's rays are found the three elements—luminous, caloric, and chemical or actinic—represented by the amber, red, and blue rays, respectively. The amber possesses power to decompose carbonic acid; the red stimulates, causing the various stages of excitement, irritability, etc.; the blue or violet ray promotes assimilation, induces calmness, contentment, and relaxation, but most important of all it has the power of penetrating the tissues of the body and destroying the microbes, thus being of special value in case of deep dental abscess, or other mucous or sub-mucous inflammation.

In France the insane asylums are so equipped that patients with various forms of insanity are kept under the influence of the different lights—*e.g.* pa-

tients greatly enervated or weakened are placed under the red light, which quickens them into new life. If erratic and violent they are consigned to the blue room, where the influence of the blue light corrects these symptoms.

Flammarion, the French botanist, performed the following experiment showing how the various lights influence plant life:

Having germinated the seeds of a plant he removed a number of the plants from the soil, when they had reached a uniform height of twenty-seven millimeters, transplanting them to beds all having the same soil and water supply, but placing them in equal numbers under blue, white, green, and red glass. At the end of three months the plants under the blue light had not grown a millimeter; they were not dead but were apparently asleep. Under the white light the stem of the plant had grown to one hundred millimeters; under the green to one hundred and fifty-two millimeters, while under the red the growth had been extremely rapid, the stems having grown to four hundred and eighty-three millimeters. These plants, however, were found to be abnormally sensitive, the leaves folding up at the slightest touch, the plants swaying to a breeze so slight as not to affect those grown under the other lights. This experiment was repeated a number of times on geraniums, lilies, etc., always with the same result.

Some investigators seek to account for the varying effects of the different colored lights on the principle that "All that is is vibration"; that the vibrations of our little world are what make life agreeable or disagreeable; *e.g.* music in its different time, key, or theme, by its varying vibrations, produces sensations either elevating or depressing.

The undulations which provoke in the family of man the sensation of heat are composed of between one hundred billion and four hundred billion vibrations per second, the retina of the eye not being influenced by this number of vibrations. The red ray, however, is accompanied by five hundred billion vibrations per second, and the blue ray by seven hundred

and twenty-eight billion per second. The blue ray, therefore, by its more rapid vibration, not only more radically affects the nervous system through the optic nerve, but also for the same reason possesses greater power of penetration, giving it its actinic property.

As the various articles upon this subject written by dentists pass in review, it is of interest to note the widely divergent aims with which they began investigation.

Dr. Redard says, "Struck by the numerous inconveniences that general anesthesia presents, surprised at the considerable number of cases of death which the employment of general and local anesthetics carry in their train, I have devoted myself to the study of this question, to ascertain if by certain procedures one might not be able to arrive at anesthesia without compromising the life of his patients." This he feels that he has found in the blue ray, which possesses the virtues of both the local and general anesthetics. By this means he is enabled to produce complete anesthesia in two or three minutes, during which time minor operations may be performed without any inconvenience to the patient. He reports failure of completely satisfactory results in about 25 per cent. of the cases coming under his observation, and attributes the same to lack of concentration.

Again, we find a dentist advocating the use of the blue ray for inducing antiseptic and analgesic conditions during removal of deposits from the teeth.

That which prompted me to begin investigations in this direction was the fact that so many abscessed teeth, otherwise sound, had to be sacrificed to the forceps in order that the patient might be given relief. The inability of the mass of the profession to save these teeth had long been a source of regret to me, and when a possible solution was suggested it was gladly seized upon and proved.

CLOSING REMARKS.

The oral cavity presents a peculiarly favorable field for the use of the blue ray.

as the mucous membrane more readily permits the passage of it than does the epidermis. In this connection, Dr. Drever of Copenhagen suggests a method of sensitizing the tissues by the injection of eosin, erythrosin, and cyanin. By this means the outer tissues more readily absorb the blue light, permitting greater chemical action upon the deep inflammation. I have tried this method and found it productive of satisfactory results.

Finsen's observation that anemic tissues are permeated more readily by the violet rays than those in which normal blood circulation takes place induced him to advise compression of the integumental area, in order to render it as bloodless as possible, thus obtaining a high degree of translucence, realizing that the greater the translucence of the

tissues the more powerful the therapeutic effect will be.

In view, therefore, of the several uses to which the blue ray is already being put, is it too much to prophesy that the day is not very distant when this modest agent will all but revolutionize dental therapeutics?—when, indeed, it will have done even more for our profession than the Roentgen ray has for general therapeutics?

In closing this paper it is still with the assurance that I have not been able to bring before you anything that is new or of startling import. Indeed, I shall be content if my unworthy effort has led you to give this subject a somewhat more prominent place in your mental field than previously. I do not yet aspire to imparting education by elucidation, but only to induce education by agitation.

A RAMBLING DISCOURSE ON INLAYS.

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

(Read at the forty-fourth annual meeting of the Susquehanna Dental Association, held at Scranton, Pa., May 21, 1907.)

IN presenting a subject that has been so thoroughly rehearsed and discussed, it becomes a real difficulty to be even interesting, to say nothing of the almost impossible task of approaching the instructive.

Realizing the difficulties that involve any attempt to disseminate information on the inlay question, I shall hope to do nothing more than lend a stimulus to discussion, which, after all, is one of our surest avenues to advancement.

If today porcelain had been eradicated as a filling material, it would have left as a colossal memento the demonstrated and potent fact that the inlay process stands without a rival as a humanitarian method of restoring carious or broken-down teeth to a condition permitting the performance of their normal functions.

But porcelain has not been eradicated, nor will its obsequies be in order until such time as something better comes to take its place.

I am not here to defend porcelain, for when we consider that the inception of its use as an inlay material, even as inlays are inserted today, dates back some twenty-seven years, with the demand for its use steadily increasing, I think all will agree that encomiums at this late date would be superfluous.

But I am here to maintain the inlay principle; to assert that it is not only a humanitarian method of conserving the human teeth, but it is a means by which much temporary work, many amalgam restorations, and many crowns may be eliminated; and to affirm that the operator who is not recognizing the impor-

tant relation that inlay processes bear to the operative dentistry of today is neither maintaining a standard in keeping with the high standing that our profession has justly earned, nor is he giving to his patients that which is their due.

It is a significant fact that inlays are tabooed mostly by those having little, if any, real knowledge of the art; or by those who, by following methods which are based upon unsound principles, have made failures, and in consequence feel justified in condemning the work as worthless, instead of endeavoring to fathom the cause of failure and, when found, applying the remedy.

I believe the greatest cause of failure lies in depending upon the adhesion of the cement to retain inlays in position. So firm am I in this belief that I have no hesitancy in saying that the sooner the dental profession in general and inlay enthusiasts in particular realize the fact that the adhesion of cement *unassisted* will *not* retain inlays in position, the sooner will inlay work attain the prominence to which it is justly entitled.

All methods and theories to be enduring must be founded upon and associated with fundamentals which, if mechanical, are in accord with the common mechanical laws pertaining thereto. Expert expressions on the subject, exhaustive experiments by Drs. Poundstone, Head, and others, and personal experience lead me to the conclusion that the retention of all inlays is in the main a mechanical process.

That this deduction may be made perfectly clear I call your attention to Figs. 1 and 2. Both are typical so-called "saucer-shaped" cavities, differing only in the depth to which they enter the tooth-structure. The margins, floors, and side-walls (if they can be considered as having the latter) are made as smooth as fine stones and plug finishing burs can make them, and the corresponding inlays constructed to fit the cavities as perfectly as human hands can do it. Any brand of cement known to the profession is applied to these two smooth surfaces, and they are brought into the closest apposition which is possible with the process,

and pressure maintained until crystallization is complete. No attempt has been made to etch, groove, or undercut, because we are now dealing with adhesion unassisted.

Presupposing these to be cases in practice, the teeth are finally allowed to return to their natural environment. Bathed in saliva from without and supplied with fluid from within, they continue normally to perform the various functions incident to these organs. If the adhesion of cement be the true principle upon which inlays depend for their subsistence, it would most naturally follow that each inlay would be a permanent restoration, serving its purpose until fracture through accident or recurrent caries necessitate further repair.

But the adhesion of cement is *not* the true principle of retention, and I challenge any man to prove that either cavity (Fig. 1 or Fig 2) is prepared upon principles which would under natural conditions give any permanent degree of satisfaction to patient or operator. except, if you please, the satisfaction of ascertaining that the theory of adhesion, "crystallization under pressure," or stick on suspicion, is not worthy the consideration of any mind disposed to be practical.

To further illustrate the fallacy of the adhesion theory, I quote from Dr. Geo. C. Poundstone's article, "The Cement Problem in Inlay Work" (*DENTAL COSMOS*, vol. xlvii, pp. 756 to 778):

"For the purpose of determining the adhesiveness of the different cements [note *different cements*, for some ten were tested], tests were made as follows: Blocks of ivory were carefully prepared with the surfaces to be cemented together having an area of 60 square millimeters, approximately that of the surface of a large inlay. These surfaces were roughened with a vulcanite file, and the blocks were then cemented together. They were kept dry for 24 hours, when they were pulled apart, with the following results. The number of pounds given being the average of a number of trials in each case: 46½, 46, 44½, 23½, 31½, 45½, 59½.

50½, 42½, and 35½ pounds." [The highest and lowest tests were 72 and 18 pounds.]

"Repeated tests were made by cementing the blocks together and keeping them in saliva in the incubator at 37° C., but in every instance the force necessary to separate them was so slight that it was impossible to measure it with any degree of accuracy. These were flat surfaces with the force applied perpendicularly to the surface. When force was applied parallel with the surface, *i.e.* when an attempt was made to slide the blocks

Add to the above the various practical tests with which we are all familiar, and then formulate conclusions.

I firmly believe that I voice a very great majority, if not all, of the successful inlay workers of today, when I say: Not until such time as we are favored with a bond that will so attach itself to tooth-structure and to porcelain that it becomes, so to speak, a part of both, will we be justified in depending upon the adhesion of cement to retain inlays in position. If the adhesion of cement will not retain inlays in position and suffering

FIG. 1.



FIG. 2.



FIG. 3.

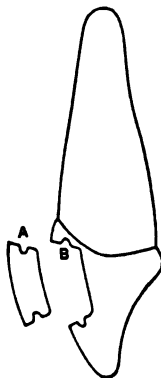
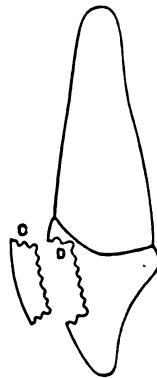


FIG. 4.



apart, considerable resistance was met with, the film of cement apparently interlocking into the uneven surfaces of the blocks on either side."

After exhaustive tests on the same question ("Tests on the Inlay Cement Problem," DENTAL COSMOS, vol. xlvii, pp. 779 to 789), though on somewhat more practical lines, Dr. Head concludes: "That glazed or ground porcelain with smooth ivory has but little power of adhesion for cement. . . . Etching of porcelain with hydrofluoric acid is a valuable means of obtaining adhesion of porcelain with cement on flat, shallow fillings; yet undercuts are to be preferred where they can be obtained, and there is good reason to believe that the best results can be gained by both undercutting and etching the filling."

humanity is to be benefited by inlay processes, it becomes necessary to recognize and take advantage of certain mechanical principles, which have for their support something more palpable than mythological concepts.

The formation of the cavities in Figs. 3 and 4 is at once indicative of permanence; for a retentive form or box-like receptacle not only favors but takes advantage of all the theories of retention, good, bad, and indifferent, known to the profession at the present time. Right-angle walls form in themselves the strongest resistance against force, and inclined planes facilitate adaptation, which, with increased cavity surface, enhances the adhesion theory and at the same time lends assistance to "frictional resistance."

Figs. 1 and 2 do not admit grooving of either cavity or inlay, except on the basal aspect, and grooves so placed, *i.e.* with the direction of force, are a delusion and a snare when viewed from a mechanical standpoint; for if the cement is to act as a mechanical retention the grooves must be placed *opposite* the direction of force, thus forming the seat for a key, Fig. 3, A B, or a series of keys, Fig. 4, C D. A B represents a groove made with a knife-edge stone all around the walls of the inlay, and a corresponding groove made with a wheel bur around the cavity wall. C D is to represent grooving and etching the inlay over the entire cavity surface with a knife-edge stone and acid, and corresponding roughening of the cavity with dentate and wheel burs, the cement key or keys bearing the same relation to the inlay that the steel key bears to the wheel on a shaft. To revolve the wheel on the shaft would necessitate shearing the key or breaking the wheel. Precisely the same results would ensue were an attempt made to dislodge the inlay, provided, of course, the cement had not become softened or dissolved. As all cements are prone to disappear when in contact with the fluids of the mouth, the margins of the cavity and the corresponding inlay margins, when the inlay is cemented in position, should be in the closest proximity possible.

The best method I have found to diminish the cement film at the marginal joint is to reduce the thickness of the platinum at this point by re-burnishing it to the cavity margins.

Seldom indeed do cases present admitting procedures that would yield such ideal results as are portrayed by Figs. 3 and 4, but even more infrequently do we find conditions which will not admit the employment, in one way or another, of mechanical retention, no matter where the cavity may be located or in what tooth. Cavity formation is a very important consideration in inlay procedure, and as I have previously gone into somewhat extended detail upon the subject of cavity formation for porcelain inlays, I will simply state that my ideas may be had by referring to the DENTAL COSMOS,

vol. xlviii, pp. 821 to 824, or the *Dentist's Magazine*, vol. i, pp. 916 to 919.

Humanitarian methods are receiving an impetus second to no other consideration in the operative dentistry of today. Some journals have created a department devoted exclusively to the subject, and if we are to judge by the contents, all dental periodicals are recognizing their potency, for seldom do we receive a copy of any publication that we are not confronted by favorable expressions on the subject.

Gold, amalgam, cement, and gutta-percha have served us well, and still occupy a very important position as dental filling materials. The rubber dam, with its corresponding clamps and ligatures, will, in all probability, never be made conspicuous by its absence. But does it necessarily follow that because these materials have been faithful, or because we see large and beautiful restorations that have stood the test of time, that we as dentists shall blind our eyes or dwarf our reason to a method because its adoption would necessitate a change in our technique?

Is there an iota of validity in the reasoning that because we have replaced with a filling or a crown the inlay that a misinformed operator inserted in an ill-shaped cavity, the inlay principle is, therefore, diametrically opposed to success? Is it to be conclusive or corroborative that because we have seen an inlay the margins of which have become chipped, inlays have no place in dentistry?

Without any display of egotism I believe I am as successful in adapting crowns and bands to roots as the average practitioner, but the more I see of the work done in years gone by, the more I am inclined to think that crowning by the methods we were taught is a sort of necessary evil, and should be utilized only as the very last resort.

But to conserve these badly decayed and broken-down teeth by the filling method, in many instances we entail torture and nervous strain akin to barbarism. Pleasant (?) to sit one, two, or more hours with mouth agape, head

reared back, and an electrically propelled sledge-hammer playing a lively tattoo on an organ surrounded and supplied with sensory nerve tissue!

Dr. Kirk is quoted as saying, "If a tooth is worth a dam, put it on." Very good advice at the time it was given, but when my dentist tells me one of my teeth is worth a dam, I say, Put in an inlay!

I have vet to hear a dentist proclaim that inability was the cause for delay in adopting inlay methods, and when I ponder over the condition this would indicate, I am always a bit more sanguine in my belief that dentistry as a profession will never retrograde.

We have been told that inlay technique is as easily acquired as falling off a log. I am not in accord with such views, and I believe such erroneous and delusive statements have done much harm to a good cause. Take, for example, the man who, after perusing a few essays and attending several clinics, gets the inlay fever. Well, his temperature cannot be measured with the ordinary clinical thermometer, and forthwith an outfit is installed, and under the many delusions an attempt is made to make and insert an inlay, but with what results? Too often the furnace is consigned to an out-of-the-way closet or a high top shelf.

It is said the life of Robert Bruce was once saved by a spider, but it is not a corollary that a web woven across the orifice of the gas or electric muffle would tend to lend longevity to the inlay principle. I do not wish to imply that inlay methods are surrounded by intricacies or mysteries, or associated with manipulative skill beyond the grasp of ordinary ability. Not at all; for were it so it would be a detriment to humanity instead of a relief. But an acquired dexterity, suppleness of fingers, and delicacy of touch must be mastered before any degree of success may be expected, and this can come through extended experimentation only.

The only palpable argument that can be advanced against porcelain as a filling material is its lack of strength. In every other respect it stands *nemine contradi-*

cente, the inlay material *par excellence* of today, and it is lamentable that its edge strength is not in proportion to its many admirable qualities. But where porcelain is weak, gold is correspondingly strong, and for this reason alone gold as an inlay material has been receiving a great deal of attention; and justly, too, for thin walls and attenuated edges may be protected from force and consequent fracture in a manner not to be approached by any other filling or inlay material known to the profession at the present time.

The same general fundamentals that govern cavity formation for porcelain apply with equal force to that for gold inlays, except that beveled cavity margins are admissible, and the gold may be carried as a somewhat thin covering over a weak wall or margin, which would otherwise be exposed to direct occlusal force. Many methods have been advanced for accomplishing the same end, *i.e.* adapting matrices and making corresponding inlays of porcelain and gold. To be rationally eclectic is a very desirable attribute in any vocation, and particularly is this so in dentistry, for by confining ourselves to one fixed rule or method we are apt to become narrow, less skilful, and perchance may inhibit advancement.

The method of burnishing directly into the cavity and the impression and swaging method of constructing matrices for porcelain and gold inlays have their respective adherents and champions. Personally, I favor the use of both, believing that I can thereby in some cases relieve the patient of pain, and in others lessen the time in the chair, and in all cases do better work.

A sharp impression can only be had by confining the impression material, and I ask your indulgence in considering a series of trays that I have used with considerable satisfaction to myself and *clientèle*. These trays are readily made, and are suitable for carrying the impression material to all remote margins of the cavities for which they are designed, and holding it there they produce sharp, clean impressions from which swaging

models are made in fusible metal, cement, amalgam, or whatever material best suits the individual requirements or peculiarities of the case.

ing manner: The tray and impression are embedded in a cake of moldine, the impression slightly oiled, and a die-cup of the S. S. White dental swager in-

FIG. 5.

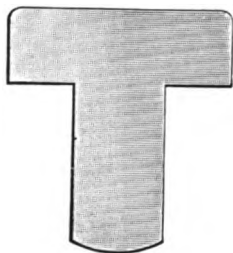


FIG. 6.

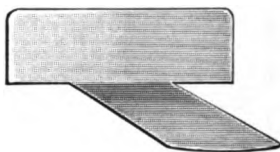


FIG. 7.

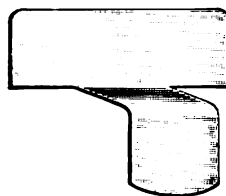


FIG. 8.



FIG. 9.



FIG. 10.

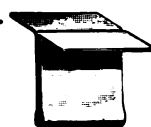


FIG. 11.



For all approximo-occlusal cavities trays are made as follows: A piece of No. 23 gage "Iridiumoid" plate is cut in the shape of a T (Fig. 5); a right-angle bend is made at the juncture of the cross section or arms and the stem (Fig. 6); an opposite right-angle bend is next made at a point about midway between the first bend and the base of the stem (Fig. 7), thus forming the floor of the tray and the little handle; the arms of the T are then conformed to the floor of the tray—silver soldered if desired—and we have the result shown in Fig. 8. The tray is then tried to the case, adjusted, contoured, and trimmed as may be required, and it is ready to receive the impression material. A piece of "Perfection" impression material of suitable size is dry-heated, placed into the tray, and forced into the cavity. When cold it is withdrawn from the cavity and we are ready for the model or die. For this purpose I use almost exclusively Spence metal, and in the follow-

verted over it. The metal is then melted, the ladle thoroughly jarred on the top of the work-table, so as to exclude any air

FIG. 12.



FIG. 13.



in the molten mass, and just before crystallization takes place it is poured through the hole in the die-cup on the impression, and while still warm the die is separated from the impression.

In making a matrix of either platinum or gold, it is adapted to the die by the

aid of spunk, burnishers, etc., in very much the same manner as a matrix is adapted to a tooth-cavity; the final adaptation being perfected by swaging with a cone of moldine on the end of the plunger. Moldine has the happy faculty of entering all inequalities and giving a uniform pressure at all points, thus giving perfect adaptation with little force.

In my gold inlay work the matrix is No. 36 gage—or for very large cavities, No. 34 gage—of 24-k. plate. After final swaging it is removed from the die and strengthened by melting 22-k. plate—not solder—in the deeper places, care being taken not to impinge on the margins at any point. At the next sitting the matrix is burnished carefully but thoroughly to all cavity margins, and completed by one or another of the many methods that have been advocated from time to time in the various journals.

To return to the trays. When one or both approximal surfaces and the entire occlusal surface are in need of repair, a different tray is indicated: A band as for a shell crown is conformed to the tooth, and the joint soldered (Fig. 9); a piece of metal of proper length and width is folded upon itself at the center, and the free ends turned out at a right angle (Fig. 10), thus giving us another T-shaped piece; the band is then set on the top of the T, soldered, and trimmed. (Fig. 11.)

For labial and buccal cavities still another form is required: A handle with a socket admitting No. 11 gage copper wire is made by utilizing a tooth-brush handle, and making a ferrule and socket of German silver. A piece of iridium-oid plate is cut a little larger than the cavity and a hole punched in the center of it; it is then conformed to the tooth and the copper shank, 11-gage wire, fitted to the hole in the tray and soldered (Fig. 12); copper is used for the shank, as it is easily bent to any desired angle. The tray and handle are then assembled, (Fig. 13), and a cone of Perfection compound, of suitable size and dry heated, is attached to the bottom of the tray and

carried to the cavity. The force on the tray should be downward and rootwise, and by having the shank bent at the proper angle, this is easily accomplished and an even pressure maintained, and as the gum tissue is forced away, a good impression of the cervical margin of the cavity is obtained.

The tray, with the impression, is withdrawn from the handle, mounted intact in a cake of moldine, and proceeded with in the same manner as previously described, except that in constructing porcelain inlays—after final swaging of the platinum matrix—a layer of foundation porcelain is fused into it and the matrix burnished to the cavity margins.

I consider burnishing the matrix directly to the cavity margins a very important consideration when using the impression and swaging method for making matrices for either gold or porcelain inlays, because be it remembered we are twice removed from the original, *i.e.* the impression is one remove and the model another, and who can tell what insignificant discrepancy has passed unnoticed in either impression or model to mar or defeat our best efforts!—

The best-laid schemes o' mice an' men
gang aft a-gley.

In conclusion I wish to say with all the emphasis which is possible, that it is the duty and should be the ambition of every practitioner not only to restore carious teeth in a manner commensurate with our professional status, but to endeavor always to enhance our dignity by elevating to the highest degree of perfection our armamentarium and our *modus operandi*. To do this does not mean employing a portion only of the methods or materials of proved worth at our command, nor allowing conservatism to lose its identity by becoming engulfed in pessimistic reasoning.

The inlay principle is no longer an experiment—thanks to the few lion-hearted pioneers who labored so assiduously—it has long since passed that stage, the experimenting being now centered upon and confined to the best methods of employing the principle, and to the selection and

apportionment of the most suitable materials. This would be a comparatively easy task were it not for the dissimilarity in the requirements, conditions, and environment with which we are confronted, and which tend to make the scientific selection somewhat complex; for what may be the ideal method or material in

one instance may prove an absolute failure when applied to another, or without judgment.

Concerted effort in practical experimentation is a valuable means of attaining this desideratum. A fundamental American principle is the equality of opportunity and the equality of burden.

CORRESPONDENCE.

THE QUESTION OF "PRIORITY" AGAIN: "THE MATRIX AS AN AID IN CAVITY PREPARATION."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—You will no doubt agree with me that it is interesting to note the continuous scramble among some members of the profession for priority in the use and publication of certain methods of practice. The Cosmos seems just now to be the battle-ground, Dr. Case having literally flattened out the "new school" claimants; and now Mr. Wm. M. Gabriel, London, Eng., takes issue with Dr. W. Leon Ellerbeck on the question of priority in the use of the matrix to protect the gum and the pulp during the preparation of the gingival wall in approximal cavities in molars and bicuspid.

Mr. Gabriel says he has no doubt he was not the first to use the method, but points out that he used it before Dr. Ellerbeck—see *British Journal of Dental Science*, July 15, 1905. That may be conceded, but the date of publication by Dr. Ellerbeck does not antedate the time when he had told many of his friends of its applicability.

At the banquet of the Fourth International Congress, St. Louis, 1904, I sat at table with Dr. Ellerbeck and Dr. James Truman, and while there Dr. Ellerbeck explained the method to us—which Dr. Truman will remember if his

attention be called to it. Since that time I have shown the method in clinics and have published it in the *Dominion Dental Journal*, and I have also taught the method in the Royal College of Dental Surgeons as early as October 1904. I dare say Dr. Ellerbeck can show that he used the method and published it years before he mentioned it to us; or perhaps he will show that someone else suggested it to him. Dr. Ellerbeck must have mentioned the method to a number at the congress, or else it was in general use in the West, because others told me about it before its publication in 1905.

It is often difficult to trace the origin of new methods, because they are usually thought of by several at the same time, and often at great distances from each other. It is an instance of the usual case of a need bringing forth a device which fills the demand. Hence, why should there be such a pother about one of the tricks in the use of a matrix? Because a method is new to Dr. Crenshaw it does not follow that it is also new to everybody else, or that he is claiming priority for its authorship.

Yours truly,

A. E. WEBSTER.

TORONTO, July 10, 1907.

PROCEEDINGS OF SOCIETIES.

NORTHEASTERN DENTAL ASSOCIATION.

Twelfth Annual Convention.

WEDNESDAY—*Morning Session.*

THE twelfth annual meeting of the Northeastern Dental Association was called to order in Horticultural Hall, Boston, Mass., Wednesday, October 17, 1906, by the president, Dr. Thomas J. Barrett, Worcester, at 10 o'clock.

The first order of business was the reading of the minutes of the last annual meeting.

Motion was made and carried that the reading of the minutes be dispensed with inasmuch as they had appeared in full in the printed report of the Transactions, of which a copy had been mailed to each member.

The next order of business was the reports of officers and standing committees.

The editor, Dr. David Manson, Burlington, Vt., reported that the proceedings of the last meeting had been published, and that a copy had been sent to each member of the association.

Motion was made and carried that the report be accepted.

Dr. E. O. Kinsman, chairman of the Necrology Committee, reported the deaths of Dr. J. E. Davenport, Northampton, and Dr. D. M. Clapp, Boston, during the year.

Dr. Maxfield moved that a committee of three be appointed to prepare resolutions of regret on the deaths of Drs. Davenport and Clapp, and nominated as that committee Drs. L. D. Shepard, S. S. Stockwell, and James McManus.

The motion was carried.

Dr. Boardman, chairman of the Executive Committee, reported as the report of that committee the program for the present meeting.

The report was on motion received and adopted.

Dr. Kinsman then read the resignation of Dr. D. B. Ingalls, of Clinton, Mass., as an active member of the society.

Motion was made and carried that the resignation be accepted.

Dr. Gilbert moved that he be placed on the honorary membership list of the association.

The motion was carried.

Motion was then made and carried to adjourn until the afternoon session.

Afternoon Session.

The meeting was called to order by the president, Dr. Barrett, at 2.30 o'clock Wednesday afternoon.

Dr. James McManus then took the chair, and the president, Dr. THOMAS J. BARRETT, read his annual address, as follows:

PRESIDENT'S ADDRESS.

I esteem it a high honor to have been chosen to preside over the deliberations of this, the twelfth annual meeting of the Northeastern Dental Association.

It is with much pride and satisfaction that I welcome you as members of this great organization of New England dentists; and it is with the sanction of the Executive Committee that I extend a most hearty greeting to all the ethical members of the profession, and bid them welcome to the sessions and deliberations of this convention, with the hope that its work, essays, and clinics will result in benefit to us as dentists, and through us to the patients that we serve and to the public at large.

Attendance at this meeting will compensate any dentist who gives it the time, as the papers and clinics that are to be presented have been prepared for us by men whose achievements entitle them to speak upon and demonstrate with authority their special work.

That which properly is now my duty gives me more pleasure than any act of mine in connection with the arrangements for this meeting, and that is to thank the gentlemen of the various committees and sub-committees whose services I enlisted in the work. They have shown marked ability, great care, and perseverance in the labor performed, and are entitled to the fullest measure of praise and the grateful recognition of their efforts at the hands of the members of the association.

Nothing is more sure than that a compact body of men working together will accomplish more for the advancement of any cause or science than any individual can hope to do by himself. That that has well been demonstrated no one can doubt, when we consider the little progress that the professions of medicine, surgery, and dentistry made while each man kept his knowledge and discoveries to himself; but when it was made available by those of ability, the progress became more rapid, and everyone received more than he gave.

We are all conversant with the early history of dentistry and its humble beginning in this country, the difficulties encountered by the early practitioners, the lack of sympathy and support by the medical profession, and the great bar-

riers that had to be overcome to reach a proper professional recognition. All these obstacles are fast disappearing, and we have been brought to realize that true advancement consists in the elevation and improvement of the largest possible number of those engaged in any calling, and not in the accomplishments of an occasional genius, whose attainments cannot be made use of by those of average ability.

Perhaps nothing would better illustrate the progressive march of dentistry and its present importance to the health, comfort, and higher civilization of our race than to recall the time when dentistry mainly consisted in the art of extracting diseased teeth and relieving the pain caused by them. From that condition dentistry rose to a highly developed technical branch, and the dentistry of today has reached such a status that the happy combination of the practical and theoretical has made dentistry a recognized science.

This improvement, while it has been marvelous and rapid, has been of a most healthy and vigorous kind, and has largely resulted from the organized efforts of the best men in the profession. Organization work has resulted in raising educational standards and the preliminary requirements of those that seek to enter dentistry. This has been found necessary to meet the advanced requirements that progress has exacted. Association work has helped to make uniform and to bring about the improved methods of teaching which have been adopted by nearly all the schools and colleges; and today most of the dental schools and colleges of this country, with their brilliant corps of teachers, represent the best the world has ever known in dentistry. The American dentist has been the teacher of advanced and scientific dentistry to the nations and empires of the old world. In return for this, many of those countries have of late been erecting barriers to exclude the American dentist, and are endeavoring to establish national schools to educate their own young men, and compel their people to patronize them

through this exclusion. Legislative barriers and legal exclusion, however, will never have the effect of dislodging the American dentist, who is at the head of the procession and will ever remain there.

It is a fact generally admitted by dental pathologists and practitioners that dental caries with its sequelæ is the most common disease of the human race, and that this disease is more rapid in its progress and widespread today than ever before—particularly among the civilized nations—and with each generation ushered into the world the ravages of decay increase. That being the condition of the people, the work and duties of the dentist are much greater and more widespread than ever before. Are we meeting this condition in a general and effective way? It is true that as a profession, and as individuals with rare and special accomplishments, we have in the cases that have come under our care and observation met the requirements, but as men charged with the care of all the people along our special line have we come up to the highest point of efficiency and usefulness to the community? We all agree that preventive treatment is the most desirable of all, whether in dentistry, medicine, or law. What are we as a body of professional men doing in the way of general and enlightened work to prevent diseases that have their origin in the oral cavity? Sound teeth and clean mouths are as necessary for the preservation of the public health as are any systemic conditions that can possibly be described; also as a preventive of acute and chronic diseases.

It seems to me that more work of a public nature should come from the dentist, as such work would, among other things, tend to the education and enlightenment of the general public on the importance of the care of the teeth and the cleanliness of the mouth. I feel sure that a very large percentage of our cosmopolitan population is in total ignorance of the dangers that are lurking in the neglected mouths of the vast number of people with whom the dentist never

comes in contact, unless it be to relieve the pain caused by a diseased tooth or to extract it. I have no doubt that in this community there are many people who give more time to polishing their shoes than they do to polishing and cleaning their teeth. I know full well the difficulties that a discussion of this phase of the case opens up before us, but if it did not present some obstacles, it would be so simple as to awaken no thought in us, and would not be worthy of our consideration and time.

The place to discuss ways and means for spreading enlightenment and education along this line is in dental meetings such as this one. It is our duty as professional men to obtain and disseminate accurate information that will be beneficial in promoting and improving the general public health, and in pointing out conditions that we consider dangerous to it. The first step of progress in this direction must come from us, and we must create and awaken an interest among our citizens generally, on the importance of sound teeth for the healthy development of the child. It is believed that if communication between mouth and mouth can be prevented, communicable diseases can be largely diminished. What is there, then, more necessary to public health than clean and wholesome habits of oral hygiene? In our public schools, where habits of personal neatness and cleanliness are being taught, what is more important than to give instruction on the care of the teeth and mouth?

What a sad sight it is to one of our calling who has had the opportunity to make even a partial examination of the teeth of any considerable number of the younger children in our public schools, to note the large percentage having the deciduous teeth decayed to the gum margin, or else abscessed and unfit for use as organs of mastication. Talk with them, and you will find that many have never had their teeth brushed or their mouths washed. The arrival of their permanent teeth is their only chance or hope to es-

establish healthy nutrition—an absolute necessity for their physical well-being. This condition I believe to be due to ignorance of its importance to the child's welfare in most cases, and to indifference and neglect in the remainder. The indifference and neglect we can lessen, the ignorance we as dentists can overcome by well-directed effort.

Reports have recently been made on the result of experiments conducted to discover whether proper mastication and enjoyment of food would affect the working powers of the individual. The experiments covered a period of four and one-half months, and the nine individuals submitted to the tests did not change their ordinary mode of living, leading sedentary lives, and taking no more exercise than before the experiment began. It is claimed that at the middle of the experiment the men had gained fifty per cent. in endurance, the second half showing as marked an improvement as the first. At the end of the experiment the men were able to do double the amount of physical work, as shown by gymnasium tests. The report goes on to state that it is in the power of a healthy individual to double his endurance in five months by thorough mastication, prolonging the enjoyment of food and acquiring a more sensitive choice of amounts and kinds to meet the varying daily needs of the body.

In view of this report on the great gain in physical strength and endurance through proper and complete mastication, I would ask, What is to become of that part of the younger generation whose mouth-conditions I have described, as to health, strength, and endurance, when they have not teeth fit to masticate with? What is more necessary for the strength and endurance of the nation than the individual strength and endurance of its young citizens? It has been shown with convincing force through medical inspection, wherever it has been adopted, that thousands of school children are failing to make adequate use of school privileges because of physical infirmities of one sort or an-

other, and examination and advice concerning the care of the teeth is not included in the scope of this medical work, except in a very few places.

I believe in its wisdom, and would recommend that some effort be made to make a beginning along this line in the public schools. It might be advisable at the outset to recommend the adoption of a text-book to be used as supplementary reading on the care of the teeth and mouth, or the introduction of periodical talks on the subject by those competent to give advice. The need for this work, and its final adoption in some form, should not be left to those outside our profession to establish. We should devise some plan with which to make the start, and work for its adoption. I do not advocate at this time dental inspection that would involve any work of repair on the teeth, or expense to the city or state, but I do think that some system of inspection which would bring to the attention of the parents the condition of the child's teeth, and the friendly advice to consult with some dentist, would be productive of great good. I have no doubt that any effort we may make in this direction will be met with some opposition. Many will fail to appreciate work of this kind, and will place obstacles in the way of its progress. Our duty, however, is to aid in the advancement of dental knowledge, and render it useful, as the contribution of public-spirited citizens to the good of the community. Upon our efforts and their success will depend the adoption of this form of public education.

The dentistry of today is not the dentistry of the past. It is, and should be, more earnest in its endeavors to apply preventive treatment to the various pathological conditions that appear within the mouth than it is to repair them with a perfected technique. The necessity for broadening the scope of dentistry beyond its mere mechanical accomplishments has arrived, and treatment of systemic symptoms that have a direct bearing on oral conditions, and the general health

as well, must be met with a comprehensive knowledge of pathology and general medicine.

Discussion.

Dr. C. R. LINDSTROM, Boston, Mass. I want to thank Dr. Barrett for his most admirable address. I think it a very valuable one, but would like to call your attention to one point. What he says about European countries failing to recognize American diplomas is not a fair statement of the case. Europe has done no more or less than has been done by the states of the Union, for today there are very few that recognize European diplomas. As a matter of fact, the states do not recognize certificates or diplomas issued in other states, but each state subjects the applicant to a special examination. So far as I know, the European countries have done nothing more than to put all men on a par. Any man will pass the examinations there if he can meet the requirements.

Dr. N. A. STANLEY, New Bedford, Mass. I think the very comprehensive address by the president is one which interests every member of the profession, bearing as it does on the care of the deciduous teeth. The inspection of children's teeth should take place in the schools; the condition of their mouths should there be ascertained, and means taken to correct and improve defective conditions. Dentistry is one of the most important branches of medical science, and I think the medical profession should give it the same degree of recognition as they accord to all other specialties. They are seemingly very slow in recognizing the importance of dentistry, and its bearing on the general health of the people.

Dr. JAMES McMANUS, Hartford, Conn. I want to thank the president for the able presentation of the subject. It is one that is being considered of late very seriously in many parts of the country. There is great necessity for the dental profession to assert itself, but to assert itself in the right way, in regard

to this matter of oral hygiene. We should not do so in such a way as would make those who wish to look on the wrong side of the matter consider that we are working for selfish purposes. But we want to assert ourselves so as to show to the public that dentistry is looking out, not for business, but for the health—physical, mental and moral—of the young children. The public wants to be assured that dentists are working for the best interests of the children, and if we proceed in the proper manner it will be convinced of that fact. Now, it is not so much examination of the children's teeth that is desirable, as it is to interest the teachers and the children in the health and care of their mouths. If it is proper for a teacher to send a child out of the schoolroom because of dirty hands, why may it not be equally proper to suggest to that child that before he comes to school he should cleanse his mouth, and to advise him as to how to do it properly. If you can make a start in that direction, and get the teachers throughout the country interested, and can show them that they have as much right to ask that the mouths be kept clean as they have to ask that the children's shoes be polished, and their faces and hands clean, it will be a step in the right direction. In many schoolrooms the same cup is used by from twenty to fifty children for drinking purposes; that cup should be protected as far as possible, and kept clean, and it cannot be done when the children pay no attention to the care of their mouths. My impression is that that could be easily accomplished if the teachers were interested in this movement.

We have started in Hartford a movement of this kind. I do not wish to appear as boasting about what we have in Hartford, but fortunately our school board and our health board each includes a dentist among its members. Our society has appointed a committee to bring this matter before these boards, and see what they can induce them to do. We hope that the action of this committee will so interest the members that they

will take some action in the matter of instructing the teachers in the importance of this movement.

The trouble in the past has been that many dentists have hesitated to do this because some might say that they were doing it for business reasons. Now, by our plan the business feature is eliminated, and all you ask is that the teachers see to it that the scholars keep their mouths clean.

I could not help saying this, and also saying how thoroughly I agree with the ideas suggested by the president in his excellent address.

Dr. HENRY McMANUS, Hartford, Conn. While I appreciate the fact that the function of the dental meeting is to do good to dentistry, it seems to me that Dr. Barrett's address contains ideas that are intended to benefit humanity at large. And while it is very complimentary to say that "this is a beautiful address," and "his ideas are good," etc., we are not doing justice to the man who offers good ideas if we do not endeavor, at least, to put them into practice. It is true that a discussion of this subject is of benefit to all, but I think we should appoint a committee to formulate a plan to put these ideas into practice. Having some knowledge of the methods of committees on presidents' addresses, I offer as a motion that a committee of three be appointed to report on this address at a future time.

Dr. G. A. MAXFIELD, Holyoke, Mass. It seems to me, under the present circumstances, that it is time some society made a move to present this matter in the proper light before the public. With the present year, a law goes into effect in Massachusetts which provides for medical inspection of the children of the schools. This law, however, does not properly consider the question of the children's teeth. I would like to see such a committee appointed as was suggested by the former speaker, whose duty would be to prepare and present at a subsequent session a resolution in accordance with what the president has advocated in his address.

Dr. McManus' motion was seconded

and carried. Dr. McManus moved that the committee be instructed to report tomorrow afternoon at the opening of the session, before Dr. Truman's paper.

The motion was carried.

The next order of business was the reading of a paper by Dr. G. BRENTON SQUIRES, Somerville, Mass., on "The New Pharmacopeia," as follows:

THE NEW PHARMACOPEIA.*

The medical profession have the honor of being the originators of the United States Pharmacopeia. It was through the energy and ability of one of its members, Dr. Lyman Spaulding, a practicing physician of New York city, that the first United States Pharmacopeia was produced.

Dr. Spaulding's plan was, briefly, as follows: Divide the United States into four districts—northern, middle, southern, and western—and have each district send delegates to what would be known as the "general convention." When assembled, their duties would be to name such materials as may be properly used as medicines and drugs, with formulae for their preparation; to establish one uniform standard and guide for the use of those engaged in the practice of medicine and pharmacy in the United States, so that the identity, strength, and purity of all such medicines and drugs may be accurately determined.

Dr. Spaulding submitted his project to the Medical Society of the State of New York. The plan was approved and carried into effect. The general convention assembled in Washington, January 1, 1820. Samuel L. Mitchell, M.D., was elected president, and the first pharmacopeia was published in Boston, December 15, 1820. Its terminology was in both the Latin and English languages.

Previous to this time, physicians re-

*[In this paper the spelling of the names of drugs is that of the U. S. Pharmacopeia, and has not been conformed, as is usual in this journal, to the terminology recommended by the American Association for the Advancement of Science.—Ed. COSMOS.]

lied chiefly upon European pharmacopœias as their authority.

Before this convention adjourned, arrangements were made for a revision of the Pharmacopœia in 1830. All subsequent pharmacopœias have followed this plan of a decennial revision, and all the general conventions have met in Washington, D. C.

The 1830 Pharmacopœia was published in Philadelphia in 1831.

The first two pharmacopœias were produced solely by medical men. The revising committee of our present Pharmacopœia consisted of eleven men from the medical profession, the remainder, fourteen, being mostly from the pharmaceutical profession.

The 1840 convention was the first to appoint a committee of "revision and publication." This committee consisted of seven members. The book was published in 1842. In this revision the Latin terminology was omitted. The process of percolation was here introduced for the first time.

The 1850 Pharmacopœia was revised by a committee of three, including the president of the general convention. It was published in 1851, a second edition being issued in 1855.

The 1860 Pharmacopœia was revised by a committee of nine members and the president of the convention. It was published in 1863.

The 1870 Pharmacopœia was revised by a committee of fifteen members, after receiving definite instructions from the convention as to the general plan. It was published in 1873.

At the 1880 convention a committee of revision was elected consisting of twenty-five members. Its powers and duties were expressly defined by the general convention. Important changes were made in this Pharmacopœia. All articles were arranged alphabetically. A new chemical nomenclature was introduced. Quantities were stated in "parts by weight," and descriptions of crude drugs and chemicals were more comprehensive and exact. It was published in 1882.

The 1890 Pharmacopœia was revised

by a committee of twenty-six members, who received instructions from the general convention. In this Pharmacopœia assay processes were given for energetic drugs and galenicals. No substances protected by proprietary rights or produced solely under a patented process were admitted. The metric system was introduced. It was published in 1893.

Delegates to the United States Pharmacopœial Convention met in Washington May 2, 1900, for the purpose of revising the present Pharmacopœia. Horatio C. Wood, M.D., of Philadelphia, was chosen president of the convention. It was voted to incorporate the United States Pharmacopœial Convention, and a constitution and by-laws were adopted, thereby making it a chartered organization.

It has been the custom to designate the different revisions of the Pharmacopœia by the year in which the convention met—as 1830, 1840, etc. But considering that it takes longer each decade for the revising committee to finish its work, and that the present Pharmacopœia was not published until 1905, and did not become official until September of that year, it was decided to designate this revision as the "eighth decennial revision," and that future revisions should follow this plan.

The present Pharmacopœia was revised by a committee of twenty-five members. They represented, as the *Druggist Circular* truthfully says, the brightest men in the medical and pharmaceutical professions.

While the first Pharmacopœia contained 624 articles, there are in the main text of the present book 958 articles; 151 articles, official in the 1890 Pharmacopœia, have been dismissed, and 117 new ones added.

Important Changes and Additions.

The "International Conference for the Unification of the Formulæ of Heroic Medicines" was held in Brussels in 1902. It was recommended that the pharmacopœias of the different countries adopt a uniform strength in the case of heroic

remedies. The United States Pharmacopeia is the first to have officially adopted these recommendations. This has made some radical changes, especially in our tinctures. Our potent tinctures are now all of 10 per cent. strength.

For example: Tincture of aconite in the 1890 Pharmacopeia was of 35 per cent., whereas now it is of 10 per cent. strength. Tincture of veratrum (1890 U. S. P. 40 per cent.), now 10 per cent. Tincture of strophanthus (1890 U. S. P. 5 per cent.), now 10 per cent.

Our tinctures now are practically divided into two classes—10 per cent. for all potent drugs, 20 per cent. for all others.

Three new and important animal products have been added: anti-diphtheric serum, dried thyroids, and dried suprarenals.

By vote of the convention the revising committee were instructed that "No compound or mixture should be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patented rights." Also, that no trade names be allowed in this Pharmacopeia. All synthetics that have been admitted are to be found under their chemical names. The metric system is employed, as in the previous Pharmacopeia.

This is the first Pharmacopeia that has included *doses*—neither the minimum nor maximum, but the average dose, being given.

An important change in nomenclature is the coining of the word *Fluidextractum* to take the place of "Extractum fluidum" of previous Pharmacopeias. This was done principally as a help to the pharmacist. It separates, alphabetically, the extracts from the fluid extracts, and tends to prevent annoyance and confusion when consulting these two classes. The proper Latin title for fluid extract of ginger, for example, is now *Fluidextractum zingiberis*, instead of "Extractum zingiberis fluidum," as given in the 1890 Pharmacopeia.

SOME OTHER CHANGES IN TITLES OF INTEREST TO DENTISTS.

"Arsenous acid" and "Chromic acid" have been changed to *Arsenic trioxide* and *Chromium trioxide* respectively. This is to conform with modern chemistry, namely, that "An anhydride is not an acid so long as it keeps dry." The misnomer "Carbolic acid" has been changed to its true chemical name *Phenol*.

Other changes in the English titles are as follows:

U. S. P. 1890.	U. S. P.—EIGHTH DECENNIAL REVISION.
Ammonium valerianate	Ammonium valerate.
Chloral	Hydrated chloral.
Colchicum root	Colchicum corm.
Diluted silver nitrate	Mitigated silver nitrate.
Ferric hydrate with magnesia . .	Ferric hydroxide with magnesium oxide.
India-rubber	Rubber.
Naphthol	Beta-naphthol.
Potassa	Potassium hydroxide.
Resin	Rosin.
Resin plaster	Adhesive plaster.
Resorcin	Resorcinol.
Rhamnus Purshiana	Cascara sagrada.
Salol	Phenyl salicylate.
Soda	Sodium hydroxide.
Sodium hyposulphite	Sodium thiosulphate.
Sodium sulphocarbolate	Sodium phenolsulphonate.
Solution of lime	Lime-water.
Spirit of glonoin	Spirit of glyceryl trinitrate.

And lastly, *whisky* should now be written without the "e."

The terminology of the hydracid salts of the alkaloids has been changed. For example, it is Cocaine hydrochloride now, instead of "hydrochlorate," the former being considered chemically correct according to modern chemistry.

The final "e" for the alkaloids and the halogens has been retained, notwithstanding that some chemistries have dropped them. This was considered wise, especially in regard to the alkaloids, as it distinguished these powerful preparations from the glucosides.

STANDARDS OF STRENGTH.

More preparations have assay processes for standards of strength than ever before. I name two that are of interest to dentists: Oil of cinnamon must now contain 75 per cent. of cinnamic aldehyde and oil of thyme 20 per cent. of phenols.

SYNONYMS.

Very few synonyms are found in the main text. The committee say in regard to this: "It is hoped that physicians and pharmacists will use the Latin or English titles given in the Pharmacopeia, so that synonyms will gradually become obsolete. Much confusion in prescribing and dispensing will in the future be obviated if this hope is realized."

ARTICLES DISMISSED.

Of the 151 articles dismissed, very few are of interest to dentists. Perhaps the following will cover them: "Ammonium nitrate," "Cinnamon cassia," "Solution of silicate of sodium," and "Wine of colchicum root."

ADDITIONS.

Many of the additions should be of interest to dentists. The following are so considered:

Acetphenetidinum. (Acetphenetidin.) Previously known by the trade name "Phenacetin," but should now be designated by the U. S. P. title.

Acidum trichloraceticum. (Trichloroacetic acid.)

Antipyrina. (Antipyrine.)

Aqua hamamelidis. (Hamamelis water.) Practically the same as *aqua hamamelidis spiritiosa* of the National Formulary.

Benzosulphinidum. (Benzosulphinide.) Commonly known as saccharin.

Cataplasma kaolini. (Cataplasm of kaolin.) An external clay preparation similar to "Antiphlogistine" and other commercial articles. It contains kaolin 57.7 per cent., boric acid, methyl salicylate, glycerin, and small quantities of thymol and oil of peppermint. Let us show our appreciation and ethical standing by prescribing this instead of trade-named products.

Cinnaldehydum. (Cinnamic aldehyde.) The principal constituent of oil of cinnamon—to the extent of 75 per cent. in good oil.

Cresol. (Cresol.) A mixture of the three isomeric cresols obtained from coal tar, freed from phenol, hydrocarbons, and water.

Eugenol. (Eugenol.) An unsaturated, aromatic phenol, being the chief constituent of oil of cloves and oil of pimenta.

Gambir. (Gambir.) An extract prepared from the leaves and twigs of *Uncaria gambir*. It takes the place of, and is practically the same in composition as "Catechu" of the 1890 Pharmacopeia. The source of catechu, which is the wood of *Acacia catechu*, is practically exhausted.

Guaiacol. (Guaiacol.) One of the chief constituents of creosote.

Hexamethylenamina. (Hexamethylenamine.) A condensation product of formaldehyde and ammonia. This chemical is sold under the following trade names: "Aminoform," "Cystamine," "Cystogen," "Formin," "Hexamine," "Uristamine," "Urietone," and "Urotropine." Is it any wonder that the convention voted that no trade names be allowed

in the Pharmacopeia? Is it any wonder that some of the best physicians consider it unethical to prescribe a trade-name preparation? Here we have a single chemical exploited by eight different firms, each concealing it by a coined word. This is rather a long word, but it is our duty to write it when prescribing this chemical, thus upholding the convention in its high ethical stand. Of course it is possible to abbreviate it, and any druggist would know what was wanted if written thus: Hex-meth-lin.

Iodolum. (Iodol.) A compound of iodine and pyrrol. Used as a substitute for iodoform. Is a grayish-brown powder without odor or taste. Contains 89 per cent. of iodine.

Liquor antisepticus. (Antiseptic solution.) Intended to take the place of similar commercial preparations. Contains 2 per cent. of boric acid, 0.1 per cent. of benzoic acid, combined with thymol, eucalyptol, oils of peppermint, gaultheria, and thyme, alcohol, and water.

Liquor chlori compositus. (Compound solution of chlorine.) This takes the place of chlorine water of the 1890 Pharmacopeia. When freshly prepared it contains 0.4 per cent. of chlorine.

Liquor cresolis compositus. (Compound solution of cresol.) This is practically a linseed-oil-soap solution of cresol. It is similar to "Creolin," "Disinfectol," "Entero-cresol," "Germol," "Cresolin," "Lysol," "Lysitol," and others; but much more definite in composition than most of these. The conservative and ethical prescriber will prefer the U. S. P. product. It contains 50 per cent. of cresol.

Liquor formaldehydi. (Solution of formaldehyde.) An aqueous solution, containing not less than 37 per cent. by weight of absolute formaldehyde.

Pilulæ laxativæ compositæ. (Compound laxative pills.) Each pill contains: Aloin $\frac{1}{2}$ grain, strychnine $\frac{1}{16}$ grain, extract of belladonna leaves $\frac{1}{8}$ grain, ipecac $\frac{1}{8}$ grain. They are the same as *Pill aloin, strychnine, and bella-*

donna of the National Formulary, with the exception of the ipecac.

Pulvis acetanilidi compositus. (Compound acetanilide powder.) Contains 70 per cent. of acetanilide, with caffeine and sodium bicarbonate. If you are going to prescribe acetanilide, do so with your eyes open. "Ammonol," "Antikamnia," "Phenalgol," "Salacatin," and other trade-name products all contain acetanilide, but endeavor to keep the fact a secret. By prescribing *Pulv. acetanilid. comp.* you know just the amount of acetanilide you are giving, besides having the satisfaction of knowing that you are prescribing an ethical preparation.

Sulphonethylmethanum. (Sulphonethylmethane.) Previously known by the trade name, "Trional." In prescription-writing it may be abbreviated thus: Sulph-eth-methan.

Sulphonmethanum. (Sulphonmethane.) Previously known by the trade name, "Sulphonal."

Thymolis Iodidum. (Thymol iodide.) Known by the following trade names: "Aristol," "Annidalin," and "Thymotol." It contains 46 per cent. of iodine.

It is our duty to become familiar with this valuable book—a volume that is considered by high authority as "an epoch-making book," and as the best pharmacopeia in the world. It is also the legal standard in most of the states.

We must bear in mind that the 1890 Pharmacopeia, as an official guide and standard, is now of no more value than a last year's almanac; and the dentist or physician who thinks that tincture of aconite represents 35 per cent. of the drug instead of 10 per cent., or that tincture of strophanthus represents 5 per cent., instead of double that amount, or who in his writing or speaking refers to phenol as "carbolic acid," or to arsenic trioxide as "arsenious acid," for example, classes himself as obsolete. Dentists, especially, have been open to criticism in this respect in the past. In a comparatively recent dental book the author

refers to "ether" as "sulphuric ether," a title that has been obsolete for sixty-five years.

It is not only our duty, but it is absolutely essential that we know the important additions and changes that have been made in this, our present official Pharmacopeia. No dentist should be without it or its equivalent.

Another matter of importance I wish to mention in closing. Dentistry is recognized as a special branch of medicine, and is represented by 35,000 to 40,000 practitioners in this country. A number of medicinal agents used extensively by dentists may seldom be used by physicians. Such articles should be made U. S. P. products. For this reason we should be represented and have a say in the revision of the Pharmacopeia.

Nitrous oxide, for example, is used more extensively in the dental profession than is ether in the medical profession. The former should be made official, so that we may be protected by a standard of purity, etc. Some form of magnesium hydroxide should be made official. Sodium dioxide, trioxymethylene, and other agents used more or less extensively by dentists should be included. Certain peroxide compounds, such as calcium dioxide, strontium dioxide, sodium perborate, and others, that give off oxygen when brought in contact with water, are being used in tooth-powders. The advisability of introducing any of these into the Pharmacopeia should be investigated and decided, to a certain extent, by dentists. We cannot do these things unless we are represented at the convention.

Article II, Section 1, of the constitution of the United States Pharmacopeial Convention says: "The members of this convention, in addition to the incorporators and their associates, shall be delegates elected by the following organizations in the manner they shall respectively provide: Incorporated medical colleges, and medical schools connected with incorporated colleges and universities; incorporated colleges of pharmacy, and pharmaceutical schools connected with incorporated universities; incorpor-

ated state medical associations; incorporated state pharmaceutical associations; the American Medical Association, the American Pharmaceutical Association, and the American Chemical Society: provided that no such organization shall be entitled to representation unless it shall have been incorporated within, and shall have been in continuous operation in, the United States for at least five years before the time fixed for the decennial meeting of this corporation."

If the dental societies will take concerted action in presenting this matter to the convention, I feel sure that it would amend the above section, so that delegates from at least one dental organization—probably the National Dental Association—could be sent to the next general convention.

It would be a great pleasure to me if this society should initiate this movement by drawing up a petition, signing it, and getting as many other societies as possible to sign the same, and present it to the United States Pharmacopeial Convention.

Discussion.

Dr. C. W. RODGERS, Boston, Mass. The United States Pharmacopeia is of course an ancient institution that has come down to us from the past century, and so far as I have been able to learn, during the first fifty years of its life it was of practically no use to the profession; but during the past fifty years it has been trying to keep up to date, and has at specific intervals had a committee at work to eliminate a great number of obsolete drugs, and insert a correct list of the new ones. That means that the U. S. P. is simply a record of the progress of the medical profession. It is never in advance of the times, but always just a little behind. It simply means that this committee has been taking these many heterodox preparations that are being brought out continually, and making them orthodox preparations. If we limit ourselves strictly to the U. S. P. preparations, we are going to be a little out of date and not up to the times.

In considering these various preparations that the U. S. P. indorses and gives directions for making, we have to take into consideration the personal equation of the various druggists and pharmacists who compound them and put up our prescriptions. It is a good deal like the process of making bread. Almost every housemaid knows how to make bread; all can do it after a fashion, but we rarely find one that can make good bread. They all use the same ingredients, but the bread is different. And pharmacists are somewhat similar; all have signs out saying they are druggists and chemists, and yet the knowledge which some of the druggists have of chemistry is very slight. I heard a few years ago of a man who sent to a druggist for a pint of distilled hydrogen monoxid; he was unable to get it because the druggist had never heard of it. Very recently there has been an investigation by the officers of the state medical boards, and they found that a large number of pharmacists did not have distilled water in their shops. Almost every prescription written which calls for water, calls for distilled water, and yet very few of them have such an article in their shops. That is another point we must bear in mind with reference to the giving of pure drugs to our patients. We must consider whether they will be safeguarded more completely by having various pharmacists compound certain prescriptions, or whether we shall use those compounded by some reliable manufacturing concern putting up the same preparation. That is a point we should carefully consider.

In the February number of *American Medicine* the same thoughts are expressed, as follows: "It is generally recognized that experts can make better mixtures than can be made by the old-style extemporaneous prescription which so many still advocate. The old profession trusted the small druggist, the new is trusting the large manufacturer, and one is as trustworthy as the other—no more, no less. The vast majority of the profession are filling their offices with ready-made tablets, pills, and va-

rious mixtures, and are harking back to the old days when all doctors dispensed their own drugs. It is an evolution brought about by the growth of modern expert pharmacy. To be sure, they are imposed upon now and then, just as the older physicians were by fraudulent substitutions in the corner drug store. We do not condemn prescription-writing for that reason, though we should do so—to be logical—if we condemn the new methods."

Mr. President, to my mind you are safer in trusting reliable manufacturers than in running the risk of getting what you want at the drug stores in the small towns.

As an illustration of what I mean, the essayist advocates in his paper our prescribing cataplasma kaolini instead of antiphlogistine. He tells us what this preparation contains, and the Pharmacopeia gives the following directions for making this preparation: Heat the kaolin in a suitable vessel at 100° C., with occasional stirring for one hour. Mix it intimately with the boric acid, and then incorporate the mixture thoroughly with the glycerin; finally, add the thymol, which has been dissolved in the methyl salicylate and oil of peppermint, and make a homogeneous mass. This should be kept in an air-tight retainer. Now, can you trust the average druggist to follow these directions? Will he stir that kaolin at 100°C. for one hour, and mix it thoroughly, incorporating these various ingredients, with the average outfit that he has at his command for doing this? I think it much safer to have some good manufacturer put up the same article for us, and rely upon him. I agree with the essayist that we should prescribe the pharmacopeial name. We can do this by writing the pharmacopeial name for the preparation, cataplasma kaolini; and then in parenthesis write the name of the manufacturer who makes this antiphlogistine. I think it would be much safer to use the manufacturer's preparation, and to write the prescription in that way, than to have some druggist at a small drug

store, who probably has never compounded this prescription before, experiment with the preparation.

To illustrate what is meant by saying that the U. S. P. is simply a record of the progress being made, let us look at some of the preparations of which the essayist speaks; for instance, *Pulvis acetanilidi compositus*, which is practically the same as antikamnia, ammonol, etc. Antikamnia has been financially one of the most successful proprietary drugs ever put on the market. What is the meaning of the action of the Committee on Revision of the U. S. P. in adding *Pulvis acetanilidi compositus*? It simply means that antikamnia is a good thing, is an established preparation, and the U. S. P. recommends it under the new name. The U. S. P. directions for making it are to reduce the ingredients to a fine powder and mix together. I think we can rely on every druggist to do this for us, and we are in this case probably safer, as we are absolutely sure of the composition.

The essayist referred to *Acetphenetidinum*. I stopped in a drug store today and asked the druggist about the preparation known by the trade name of phenacetin. He said if "acetphenetidinum" were called for in a prescription he would give phenacetin, because it was the same thing. The general manufacturers can make it now, but I think when we prescribe it that it would be safer to indicate in parenthesis the name of Bayer, because that is the name of the concern that has been manufacturing this preparation for so long a time that they must understand its manufacture better than the casual druggist. I think our stand in the matter of certain preparations should be to rely on the various chemical houses that put up these preparations, and to support the efforts of houses we all know to be reliable. My idea is that we should not feel that we should be confined entirely to U. S. P. preparations in regard to the matter of drugs. We have to be heterodox as well as orthodox. I am not condemning the pharmacists, but we should be constantly

on the alert for the best welfare of our patients by accepting every advance, not waiting for the approval of the U. S. P.

I agree with the essayist that certain dental preparations should be included in the U. S. P., and I understand that steps have been taken along this line. I believe Dr. Finley, president of the National Dental Association, spoke of this matter in his address at the Atlanta meeting, and we will probably have representation in the next U. S. P. revision committee.

Dr. H. CARLTON SMITH, Boston, Mass. We notice that the changes in the new Pharmacopeia are in the line of a more exact conformity to the scientifically correct, and of this we must, in the main, approve. We might question, however, why the name *Antipyrin* is retained and "sulfonal" rejected. Sulfonal is, or was five years ago, official in the British Pharmacopeia, and is much easier than the semi-scientific names used by our revisers of 1900. The exact chemical names for complex hydrocarbon derivatives are not practicable. Sulfonal is a diethyl-sulphon-dimethylmethan. This name gives us a definite idea of its constitution, which the abbreviated name in the Pharmacopeia gives but imperfectly. Antipyrin is phenyl-dimethyl-isopyrazolone, and is official in the British Pharmacopeia as *Phenazonum*. We can imagine no excuse for this name, and believe the trade name—antipyrin—preferable.

The last idea given us by the essayist is important, and I believe cannot be emphasized too strongly—that is, the need of dental representation on the committee for pharmacopeial revision; and if I were asked for a further suggestion which might help in bringing to pass such representation, I would say, *Write more prescriptions*. The Pharmacopeia is intended primarily for just two classes of people—the class that write prescriptions and the class that compound them (the pharmacists). To this second class the dentist is not expected to belong, but the more prominently he takes his place in the first class, the more natural

that he should become a factor in the revision of the Pharmacopeia.

You have been urged to use pharmacopœial titles in writing prescriptions rather than "trade names," yet trade names are a necessity. Here is a little book published by the *Druggist's Circular*, to which previous reference has been made; in it we find in the neighborhood of 2000 new preparations, of all degrees of value, all of them being new preparations, probably not one per cent. of which appear in the last Pharmacopeia. The U. S. P. cannot incorporate new remedies until they have been proved worthy of a place among standard remedial agents; on the other hand, the practitioner cannot afford to wait for a good thing until he sees it in the Pharmacopeia. The obvious deductions are: Keep posted. Write prescriptions in the most scientific terms available, but write them. It may mean a little more careful investigation into causes, and perhaps an examination of saliva, but if such examinations were more frequent and systematic, valuable and much-needed data would soon accumulate.

I believe that different conditions may require different preparations, and can hardly agree with the last speaker in feeling that the large manufacturer is more reliable than the better class of pharmacists.

Dr. G. A. MAXFIELD, Holyoke, Mass. I was very much interested in the paper, and feel thankful to Dr. Squires for presenting it at this meeting. I have read with interest the many changes and advances made in the last edition of the U. S. P., and think the dental profession ought to be awake to the importance of the subject. But dentists are not interested in the Pharmacopeia, because they have not been taught much materia medica. If the examining boards this next year were to base their questions in materia medica on this new Pharmacopeia, and the result of the examinations depended on this subject, I do not think five candidates out of one hundred would pass. Dental colleges do not require their students to give the necessary attention to

this subject, or rather do not impress on the student the importance of having some knowledge of materia medica in order to practice dentistry.

There is one way by which those members of our profession who are interested in this subject can make their influence felt in favor of representation on the board before the next revision of the Pharmacopeia, and that is through the American Medical Association. As the Section on Stomatology is entitled to one delegate in the pharmacopœial convention, it is for the members of that section to see that they are represented. In regard to writing prescriptions, it has been my theory that dentists should be able to write prescriptions; but very few of them do it, simply because they do not know how. A short time ago, in talking with a member of one of the largest prescription drug firms in Boston, he said that the manufacturing chemists today were putting up many formulæ of medicines used by the physicians in much better form than the pharmacist could do it, and thus a great deal of the prescription work is being displaced by the use of standard preparations. For instance, an excellent preparation, of much value in dental practice, is a tablet put up by Parke, Davis & Co. known as "Acetanilid and sodium compound with codein," and on the bottle is the formula giving just the contents of each tablet: "Acetanilid 3½ grains, sodium bicarbonate 9/10 grain, sodium bromid 1/10 grain, caffein ¼ grain, and codein ¼ grain." I have not used "antikamnia" for many years, but have used the preparation just mentioned instead. Several years ago I saw in one of the drug journals what was said to be the formula of antikamnia, and it was given as acetanilid 7 parts, sodium bicarbonate 3 parts, and caffein citrate 1 part; and "ammonal" was given as acetanilid 7 parts, carbonate ammonia 3 parts, and caffein citrate 1 part. That is, you see, a substitution of the carbonate ammonia for the sodium bicarbonate in antikamnia.

Another important thing dentists should know is how to make many of

the preparations they use; for instance, the making of cocain solutions. As it is, many send to the druggist, say, for a two per cent. solution of cocain. The druggist goes to his shelf, takes down his bottle of distilled water and makes up the solution. How long do you suppose distilled water will keep, even if the bottle be well corked? In a few days you will notice a flocculent precipitate, showing that the water was impure; then again, even if made from pure water, the solution soon becomes infected. When such infected solutions are injected into the gums, the chances are that sloughing of the gums will supervene. This, I think, accounts for some of the answers we get to questions concerning the toxic effects of cocain propounded to candidates before the state board. Many of them say it is a sloughing of the gums. Now, cocain never causes sloughing, the true cause being rather the infected solution used.

Dr. SQUIRES (closing the discussion). Dr. Rodgers, in speaking of the Pharmacopeia, spoke of its not being up to date. Of course the Pharmacopeia adopts only such drugs as have been tried thoroughly and proved useful. They could not afford to adopt them before they are proved to be reliable. Dr. Squibb says that hundreds of drugs are brought out every year, and many physicians use them for a while and then throw them aside because they are no better than those they have been using previously. So the Pharmacopeia is for the more conservative practitioner, but for the man who wants to experiment, of course it is all right to try the new drugs.

Dr. Rodgers says that the druggists cannot be as much relied upon as the large manufacturers. I think that they are just as reliable as are the latter. He referred to antiphlogistine. Unless the composition of this preparation be evident, or the makers publish the formula, it is just as much a nostrum as are other secret preparations. He speaks of the great financial success of the antikamnia company. Why not! The wholesale price of the mixture is one dollar per

ounce, while its actual cost is probably not over ten cents an ounce.

He also intimates that druggists cannot be trusted; that they adulterate medicines. We have stringent laws to care for that, and if you think that they have substituted something in a prescription, all you have to do is to carry it to the board of health, and they will prosecute the fraudulent pharmacist. When we prescribe antikamnia or antiphlogistine, and the patients suffer from the use of these agents, you cannot prosecute, because it is a secret preparation, and you are prescribing with your eyes shut. If you specify in case of cataplasma kaolini the preparation of Squibb or Merck or any of the concerns who use the U. S. P. as a standard, you need not be afraid of druggists substituting, and that is the way we protect ourselves from nostrums. Why specify "phenacetin Bayer," thus robbing our patients to the extent of one dollar an ounce wholesale, when the same thing under the U. S. P. title costs fifteen cents. If any manufacturer dared to make acetphenetidin, label it U. S. P., and not have it up to all the requirements of this book, he could be prosecuted under either the national or state law. Therefore prescribe "acetphenetidin U. S. P.," and preserve our patients' pocket-books and our own ethics at the same time.

The last speaker said that if the questions of the examining boards were based on the new Pharmacopeia but few of the students would pass. I consider this a reflection on the teachers in the schools. I think they had better wake up, and teach according to the new Pharmacopeia in order to keep up to date. The boards of Pharmacy are asking questions from the new Pharmacopeia, and have been doing so since last September.

With regard to the use of distilled water in prescriptions: Any distilled water will change in time when constantly exposed to the air, as in dispensing. In the writing of a prescription for a cocain solution, you may specify a two and one-half per cent. solution of boric acid. This will keep

distilled water from infection for months.

Motion was then made and carried to adjourn until 8.30 P.M.

Evening Session.

The meeting was called to order by the president, Dr. Barrett, at 8.30 P.M. Wednesday night.

The first order of business as announced by the President was the reading of a paper by Dr. ALFRED P. ROGERS, Fall River, Mass., on "The Correction of Facial Inharmonies," as follows:

THE CORRECTION OF FACIAL INHARMONIES.

One year ago it was my pleasure to discuss Dr. Norman G. Reoch's paper "A Plea for a Proper Appreciation of Occlusion" (see DENTAL COSMOS, June 1906, page 684), presented at the last meeting of this association. At that time I felt strongly and spoke earnestly regarding the importance of proper diagnosis before attempting the treatment of malocclusion. Following this idea, it was my privilege, later in the year, to read papers before a number of societies upon the subject of diagnosis, and when your society granted me this opportunity I determined to discuss one of the subdivisions of my former paper. Accordingly, I have chosen to speak to you this evening on the correction of facial inharmonies, but I find it a hard subject to talk about, because it embraces so much that cannot be expressed and much that we can see and enjoy, and from which words rather detract than amplify.

There is nothing, perhaps, in the whole field of orthodontia that serves to stimulate our interest and hold our attention more steadily than the study of the facial improvements brought about by skilful treatment. Nothing appeals to us more deeply, because we are instinctively lovers of the beautiful. There

seems to run through our very natures a thread that makes us appreciate harmony and balance, and depreciate the inharmonious, and when we find the latter in the facial lines as the result of malocclusion, and are able to correct it, we may well consider ourselves in the light of benefactors. But to be of the highest good in this or any special work, we must enter into it with a will and a degree of determination which cannot exist unless the operator be aware that the work lies properly within his field, and that he is well fitted to perform it. Let us not forget that such work as we are discussing tonight cannot be done in a disorderly or thoughtless way; that it cannot be played at, or done without definite plan and direction, because this sphere embraces possibilities for high achievement as well as disastrous bungling. Our knowledge, then, must be accurate and clear, not negative or unilluminated.

The artistic sense holds a most important place in the study and treatment of malocclusion, and coupled with it there is, to my mind, a qualification most necessary to become efficient in this or any other work, namely, the ability to discover, the ability to see things, for we must be able to clearly understand the various conditions before we can apply a suitable and lasting remedy. Let us call this gift the gift of discernment, and where we find it cultivated, it seems to me that it is to the usual perception as the microscope is to the eye—the means by which we are able to find out the reality of things hidden beneath their outer appearance. We all have this faculty to a greater or less degree, in one direction or another, and each is served by it as he most needs. Therefore in order to do our work effectively we must ever consult this faculty, and then add to this innate power the strength that comes from discipline and training. In so doing, each will help to elevate our profession to the highest plane.

Now we have met together this evening, not alone for the study of harmony and inharmony, but also, I believe, for

the discussion of many subjects relating to orthodontia, and in order to make a broad field for discussion I am going to suggest a few topics for your consideration which I venture to hope may provoke a liberal discussion among those whose experience in life and its workings has brought to them sound judgment and wisdom.

First, let us consider at what age we shall begin the treatment of malocclusion in order to produce the best results, and also the age limit within which we may expect to produce satisfactory results in occlusion and facial lines. Frequently in the treatment of malocclusion we are surprised and almost startled at the apparent psychological effect produced by the improved conditions of the patient; possibly some of the more enthusiastic of us give greater credit to this action than would seem warranted. Therefore, let us discuss this question, and endeavor to arrive at some definite and clear conclusion.

One more question that I think will admit of interesting discussion is that of heredity. So many of us hold different opinions regarding this factor that I believe a discussion upon it may be productive of valuable conclusions. Not infrequently, on being consulted by those suffering from malocclusion, we are told of relatives, near or distant, who have been subject to similar conditions of malformation, and we are apt to be led to believe that heredity is unmistakably to blame in such cases. There being no other solution at hand, many accept this explanation as final, but with careful thought may we not see where we are doing heredity somewhat of an injustice? Is it rational to blame these much-misunderstood laws for so many crimes? Heredity is kind and beneficent, but many will say, Is it not written "unto the third and fourth generation"? Truly, but this is the limit placed by heredity when we are considering diseased and abnormal conditions, for the laws of nature always tend to produce the normal, whatever be the existing conditions.

In seeking the causes of these diseased and abnormal conditions, it seems just and reasonable to me that we should inquire closely into our mode of living. Consider the rush of our artificial life—how far it is from the normal and right! Is it any wonder, then, that many of our children should show signs of physical degeneracy? Can we wonder that so many suffer from malocclusion, so many appear with pinched and drawn faces?—when fresh air is denied them three-quarters of the time; when the food is made pleasant to the taste and is so prepared as not to require active mastication, thus depriving the jaws and teeth of the very function intended by nature they should perform, and consequently, as may be expected in the case of any other organ, this lack of use will result in a proportionate lack of mandibular growth.

The logical solution of our difficulties, from nature's standpoint, would consist in inducing every organ to perform the normal degree of functional activity. Would that children lived in a normal and healthy environment, for then, slowly but surely, facial inharmonies and malocclusion would become less and less prevalent.

We must likewise resort to artificial means in order to stimulate those organs which, having been allowed to degenerate, have failed to perform their natural functions. We must bring into normal position malposed teeth, harmonize the distorted arches, and restore the facial lines to their original grace and beauty. I am strongly of the belief that it is desirable, and therefore advisable, to always strive to produce the greatest harmony; and I also believe that no man should be excused if he fail to give just and careful forethought to those great underlying principles which make high achievement possible.

We are compelled to pass over many of the details of the correction of malocclusion, in order that we may clearly concentrate our thoughts upon the correction of facial inharmonies. We will note chiefly the effects of the treatment of

malocclusion upon the facial lines, and the plan I propose to follow is to examine and study a series of pictures, in order to note the gradual improvement, or perhaps the lack of it, observing clearly where harmony has been made to substitute inharmony. I believe this plan is calculated to stimulate our interest in the subject and to train our powers of observation. In some cases we shall be pleased to note how various and gratifying are the changes that take place.

Many of us realize the prevalence of many faults and dangerous ideas. We know that some are too radical, many are uninformed, others too conservative, and none are wholly right. Our earnest endeavor, then, should be to grade all thought, to destroy the dangerous, to temper the too radical, and to enliven the too conservative.

[The pictures were then exhibited.]

Discussion.

Dr. EUGENE H. SMITH, Boston, Mass. I had the honor at the last annual meeting of this society to present a paper relating to the extraction of permanent teeth in the treatment of some cases of malocclusion, and at that meeting I showed in full all the slides I had illustrating the points that I presented. Of course I did not feel that I had any right to repeat that exhibition at this time before this same society, and when I was asked by Dr. Barrett to open the discussion of Dr. Rogers' paper this evening I was very glad to say yes, having no doubt in my mind that the essayist would say something against extracting, and then I could thoroughly disagree with him, and in that way make the discussion of greater interest. I did not know fully what Dr. Rogers might say in regard to this question, as his paper was not sent to me, but he kindly gave me an outline of it stating that he would touch upon the influence of heredity. I cannot see that Dr. Rogers has said much on heredity and its influence on malocclusion, therefore I have no right to assume his position in the matter. He

pointed out or hinted in his letter to me that it was a question whether environment did not play the greater part in the causes that produce malocclusion, rather than heredity; but I have been unable to discover from what he said that he has pointed that out at all clearly.

He has shown some very interesting pictures, and there has been a marked improvement in those cases which he has treated. Much of the value and appreciation of the pictures was lost, however, because they were not shown together. It is quite impossible to carry in one's mind two pictures that are shown in succession; while if the two pictures were thrown on the screen together we could study them to very much greater advantage. There was one picture that struck me very forcibly, namely, the one showing a condition of malocclusion before treatment. You may remember that the lady's hair was dressed in an unbecoming way, and in the next picture her hair was dressed in a becoming way, the patient being thereby very much improved in appearance, to say nothing of the change brought about by the treatment of her teeth. To be fair in a case of that kind, it seems to me that the conditions governing the taking of the pictures should be the same; that the general dressing of the person should be the same in both instances. That makes all the difference in the world as to the general effect of the picture.

I was in hopes that Dr. Rogers might take some decided stand upon extraction in its relation to the treatment of malocclusion, but I find that he has not done so, and I find that the so-called new school of orthodontists are hedging a little in regard to the question of extracting—admitting, I think, that there are times when extraction is necessary in the treatment of certain cases of malocclusion.

He has truly said that there is no such thing as a typical type to be seen today; therefore we are constantly treating cases of degeneracy. Now, what may be the

essayist's idea of the artistic benefit in a certain type may differ from my idea of the artistic treatment of the same case, and very likely we should all have different opinions as to the artistic effect to be brought about by the treatment of any given case of malocclusion. For instance, let me cite a case where we have a deficient development of the forehead, of the nose, of the mental eminence, with a narrow arch and general malocclusion. Now, if I read rightly the principles involved in the new school of orthodontia, it is claimed that these teeth, however jumbled they may be, belong in that mouth, and should be placed there in normal occlusion; that, although that mouth looks prominent and ugly, it belongs to that type of person. Now, if it does belong to that type of person, to my way of thinking he had better be deprived of some of his belongings. It seems to me that we as orthodontists should make a mouth as beautiful as we can, even though the occlusion may be a degree or two from normal. It is along this line that I think the enthusiast of the new school errs. But I wish to say before this audience that no one appreciates more than I do the great and good work that the new students of orthodontia are doing, and especially those men who are giving their entire time to the treatment and consideration of these cases. Errors they are bound to make. I still stand, however, as an advocate of judicious extraction, knowing full well that I have been injudicious in some cases. Most of us, I think, have come to the conclusion that there are few cases under the present scientific treatment of malocclusion where extraction is called for, or where, if practiced, the result is injurious; but, on the other hand, there are cases—and I find, much to my gratification, that some of the enthusiastic young men of the new school are gradually coming to my views—where we must extract. You will find many such cases in a school clinic or in a public clinic, where you meet the pronounced cases of degeneracy.

I think I understood the essayist to say

something about the lack of interstitial growth of the mandible. I have it firmly fixed in my mind from reading and studying that such a thing as interstitial growth does not take place, but that growth occurs solely in the region of the coronoid process. I may have misunderstood him, and there may have been some new observations recorded of late that have escaped me.

The essayist has spoken of heredity, and therefore it is proper for us to discuss it. Now, I am a strong believer in hereditary influence as a cause of malocclusion. The idea that a person can inherit the jaws of one parent and the teeth of another is brushed aside by some writers, but without having previously investigated the subject. They make an assertion that it seems to me they have failed to prove. I think we all agree that Dr. Talbot is the authority from the dental standpoint on the etiology of malocclusions. He still holds to the theory of heredity; he has done a great deal of investigating and made many observations, and is a deep thinker along these lines. In his recent work he quotes from the writings of distinguished investigators on the subject of degeneracy, and I am inclined to agree and believe with Dr. Talbot that heredity does exercise a very marked influence in the cause of malocclusion.

To illustrate the point under discussion I will throw upon the screen [illustrating] a slide showing the absence of the upper permanent lateral incisors in a woman of forty years of age. Her mother and grandmother both lacked these lateral incisors, and in her own family of three girls, one is lacking the lateral incisors. This instance seems to me to exemplify the influence of heredity beyond any question.

All who have been observers in the practice of dentistry have noted the differences in the shape of cusps; you have observed that hereditary tendency in the shapes of the bicuspid and molars. The shape of the mental eminence is hereditary; this may be traced through several generations, although it may

skip one. We know that atavisms may revert several generations; in one generation the deformity referred to may not manifest itself, while in the next it reappears. The evidences of heredity are seen everywhere, and in my opinion it plays an important part in the cause of malocclusion.

Dr. Cryer upon repeated occasions has shown the varied shapes of the angles of the mandibular rami—an important factor in the etiology of distal or mesial occlusion. In the attempt to controvert the argument as to the small jaw and large teeth it will not do to present a case with the jaw full of jumbled teeth, and to say to the one who repudiates that theory that it is a case of too many teeth for that jaw; because the answer will come from him that such teeth can be regulated to normal occlusion. That is true, and many of us have put a great many of these teeth in normal occlusion; but in such instances, according to my artistic sense—which perhaps may be poor—the mouth and face still showed that there were too many teeth. I have slides and casts here tonight showing what seem to me to be jaws too large for the teeth they hold, and teeth too large for the jaws that they are set into. Now if we do say that heredity was a factor in some cases of large jaws with small teeth, why is it not reasonable to believe that the reverse is likewise true.

The picture now on the screen [illustrating] shows small teeth in large jaws. The spaces between the teeth, unfortunately, do not show as well in the picture as in the casts, which I will pass around.

The next case [illustrating] is that of a patient in whom the lateral incisors have failed to erupt. Again I will mention that from my artistic standpoint she is an attractive-looking woman, and I do not think that her mouth and facial appearance would be much improved if her jaws had been widened and the incisors supplied. Her occlusion is good—of course not normal, because, when one or more teeth are lost, normal occlusion is destroyed; but I make the point that there are cases where it is not

well to strive for normal occlusion, because we would not thereby get the proper facial harmony, to my way of thinking, and therefore we are obliged to sacrifice teeth in some cases in order to secure what I term an efficient occlusion—efficient in the sense that it serves the purpose, viz, for thorough mastication, for the proper grinding of the food, and also to retain the regulated teeth in place.

The second case shown I consider to be a typical case of large jaws and small teeth. This young man's father was a large, robust man, and the mother a delicate, small woman with small teeth, and, to my way of thinking, the subject has inherited the small teeth of the mother and the large jaws of the father.

In regard to the time of beginning the treatment of any given case of malocclusion, it has been my habit not to do any extensive regulating until the permanent teeth were well in place, excepting for children when the permanent upper incisors were in lingual occlusion, in which cases I believe that appliances should be used to move the incisors out and to bring them to proper occlusion.

The question of the first molar has not been recently considered by orthodontists. The subject of the normal relation of the first molars involves a consideration of the interesting question of how we may tell whether these molars are in their proper situation, or whether they are in mesial or distal occlusion—a condition which, it seems to me, depends upon the shape of the rami of the jaw itself.

Dr. H. L. HOWE, Boston, Mass. I will hardly be able to add anything to what has been said, but I will touch upon the question of the age at which it seems best to attempt to regulate dental deformities. I agree with the essayist that it is well to attempt to correct deformities as soon as they are found, but there are cases in which the age and condition of patients have to be taken into consideration in order to decide whether they are able to undergo the operation or not.

I think there can be no doubt as to the psychological value of the correction of irregularities, for there must be a difference in the state of mind of the patient after having had a deformity corrected; it certainly must add to his self-esteem and to his personal enthusiasm in all directions.

As to the question of heredity and environment, I think there is no doubt that both are great factors in malocclusion. As to heredity, that can be shown perhaps in the case of the Boston terrier. We find established irregularities in the teeth of this terrier that we do not find in the teeth of other dogs. Perhaps their environments have something to do with it, in that they do not use the teeth so much, for it is a fact that if the teeth are not needed they certainly will not be developed.

Dr. J. H. WORTHEN, Concord, N. H. I would like to hear some remarks by the essayist throwing a little further light on the question of interstitial development which the essayist and Dr. Smith referred to. As I understood it, he probably had reference to the development of the anterior portion of the jaw, which seems to be necessary to provide room for the large permanent teeth in the place of the small deciduous ones.

Dr. ROGERS. By interstitial growth we mean that interdental development which takes place in the mouth of the normal child to provide space for the permanent teeth. A spacing develops between the deciduous teeth, and together with the enlargement of the alveolar process serves to admit the larger permanent teeth. If Dr. Smith will suggest a better term for that spacing which takes place between the deciduous teeth and the enlargement of the alveolar process, we want it.

Dr. SMITH. There is no question that the alveolar process enlarges, but it enlarges from behind outward, carrying the process out, and biologists tell us that there is no such thing as growth between the teeth.

Dr. ROGERS. What do you call it, then?

Dr. SMITH. I think it is due to the

enlargement of the jaw. As the alveolar process enlarges and widens, it carries the teeth with it; as it carries the arch out the teeth are spread, but there is no particular growth between the teeth themselves.

Dr. ROGERS. You call it development, then?

Dr. SMITH. Yes, of the jaw and alveolar process.

Dr. ROGERS. What is the difference between growth and development?

Dr. SMITH. The growth is not interstitial.

Dr. ROGERS. But there must be growth there to fill these spaces.

Dr. SMITH. Not of the jaw-bone itself.

Dr. ROGERS. But of the process, and what do you call that?

Dr. SMITH. That is development along the sides of the teeth.

Dr. ROGERS. The spaces must be filled by some growth. Where there is development there is growth.

Dr. SMITH. Then why do the biologists still claim that there is no such thing?

Dr. ROGERS. I do not know, but we must acknowledge that there is growth there.

Dr. SMITH. I am inclined to agree with the biologists, who have given a great deal of time and study to this matter.

Dr. ROGERS. But we can see this growth ourselves.

Dr. SMITH. That is the enlargement of the arches forcing the jaw out.

Dr. ROGERS. When that enlargement of the arches takes place there is a spacing which occurs between the deciduous teeth. Now those spaces are filled with bony material, bony cells, therefore there must be growth.

Dr. GEORGE T. BAKER, Boston, Mass. So many interesting points were brought out in the paper and in the discussion that I hesitate to speak upon the subject, but I think there was one phase included in the paper, or shown in the slides, which is at variance with the discussion, viz, the point that it is better to wait until the twelfth or fourteenth

year before an operation for the correction of irregularities is begun. Now, in the slides that we saw we noticed the development of the maxillæ and the other bones of the face. I claim, and I think you will agree with me, that that development would not have taken place had the operations been delayed. The time to do this work is in early life, before deformities have become accentuated and confirmed, and it is unwise to wait before treatment is undertaken; abnormalities should be corrected as soon as observed.

Something has been said about heredity. I do not care to discuss that point because I do not know much about it. I do not think we know what heredity is. We have observed its effects, and we know that there is such a thing, but I think it is wrong to claim that it is the cause of all these irregularities. I think heredity has had too much laid at its door in the past; in my opinion environment accounts for a great many of the conditions we see. Disuse of the teeth is another fertile cause. If a child have deciduous teeth that are so decayed that he is unable to use them, he does not masticate the food as nature intended, and does not use the teeth, because it hurts him to do so; therefore the teeth do not attain that natural development which takes place when they are actively used. If these teeth are cared for the child will be able to use them, and natural development will then take place. Another very common cause is nasal stenosis leading to abnormal mouth-breathing. A great deal has been said of late concerning this subject, but still I do not believe that we fully realize the importance of correcting the trouble. We are often the first to see it; the physician does not always have an opportunity to detect it; he does not look into the mouth as we do, but we look into patients' mouths and see hypertrophied tonsils and adenoid growths, and it remains for us to point these difficulties out to the parents. The responsibility rests on our shoulders, and I believe that mouth-breathing accounts for a very large percentage of irregularities, especially

those attended with marked deformity. We see it everywhere. The person who breathes through the nose, as nature intended he should do, has a very much greater chance of having regular teeth than the one who does not. We see patients every day of ten, twelve, and fourteen years of age, in whom dental irregularity is just beginning. Such patients, as a general rule, have enlarged tonsils, in some instances as large perhaps as an English walnut, and consequently the child cannot breathe normally. Therefore I think that mouth-breathing is one of the great factors in the causation of irregularities, and that the responsibility of looking out for this etiologic factor and seeing that it is eliminated rests on our shoulders.

Dr. M. C. SMITH, Lynn, Mass. I think the last speaker has touched the keynote of orthodontia when he says that *now* is the accepted time to regulate the teeth, no matter how young or old the patient may be. But I want to ask the last speaker, How in the name of common sense can a child use its teeth when it must keep the mouth open all the time to breathe? When a child comes to you with an irregularity of the teeth, the first thing to do is to see whether it can use the teeth. If it has to keep the mouth open for the purpose of breathing, it cannot use them. Now, I think the nose is of much more importance than the mouth. If a child has an irregularity of the teeth, there is an irregularity in the nose. Did you ever find a good nose and a bad mouth?—I never have. You will always find the nose in a bad condition. The thing to do is to give attention to the nose at once; never mind about the teeth for the present. We can supply good artificial teeth, but we cannot supply a good artificial nose. I defy the best nose-and-throat specialist in the country to supply a perfect nose and throat after the damage is done. Let us first of all remove the adenoids and then widen the dental arches. I don't think the tonsils can do much harm if the adenoids are removed and the arches widened. Do not put on an Angle appliance to tip the teeth, but

catch the teeth in a crib and carry the teeth and bones together, and at the same time widen the floor of the nose. It is an easy matter to pull the inferior turbinates away from the septum one-eighth of an inch on each side; thereby good breathing will be induced. I do not think one need bother about the tonsils unless they buckle against one another, and then it is a good plan to take off a piece from each gland. The main purpose should be first to get the child into condition where he can use the teeth and can keep the mouth closed while masticating.

I would like to add a few words with regard to injudicious extracting. I believe in extracting teeth if, for instance, a child when reaching the age of ten years has four devitalized first molars, and possibly an abscess on each. I believe in taking out these teeth, not at that time, but when the development of the jaw has become completed. If a child's first molars have devitalized pulps before or at the age of twelve, for how long a time can you save these teeth? I think the best plan is to wait until the second molars are erupting, and then extract the four molars. Do not take out the two lower ones and leave the two upper ones in place. One of the greatest mistakes made in the practice of dentistry today is to extract one or perhaps two teeth. If two have to be extracted, it is better to take out four and leave the jaws equally balanced.

With regard to interstitial growth: At a certain period in life the arms, legs, and other parts of the body grow, and at the same time the jaws grow. If you have a child a little undergrown, whose teeth are crowded, and that child has good breathing, wait a few years, and as the child grows you will find a corresponding growth in the upper and lower jaws. I do not know whether it is interstitial growth or not, but it is growth.

Dr. G. C. AINSWORTH, Boston, Mass. This is always an interesting subject, but it seems to me that in our enthusiasm over the correction of these cases we often lose sight of the causes that

lead up to malocclusion. The three most prolific causes of irregularities of the teeth, to my mind, are mouth-breathing, lack of attention to the deciduous teeth, and thumb or finger sucking or some pressure produced in a similar way. We know that it takes but very little pressure, if continuous, to move a tooth in the line of least resistance. Nothing has been said in regard to the care of the deciduous teeth, but it seems to me that this is one of the first things to be attended to. We are seeking to correct these irregularities without removing the cause. Sometimes the deciduous teeth are allowed to decay beyond redemption before the dentist is consulted. Are we diligent enough in educating the public to the importance of the care of the deciduous teeth? Many people do not appreciate the fact that the loss of a deciduous tooth means anything more than the loss of that tooth, although that is the way in which irregularities of the teeth very largely come about.

The question of mouth-breathing is never thought of by the parents as having any deleterious effect upon the jaws and teeth. It is quite common to find children badly afflicted with adenoids, the possible ill effects of which neither the parents nor the physician have seemed to realize, the latter certainly not to the extent of advising in favor of their removal. I recall a case which came to me from a near-by city, that of a young lady, a member of a refined and educated family. She had a very pointed upper arch, and one canine entirely outside of the arch, while in the mandible both canines were entirely outside their proper alignment. There was no question at all about the cause of the trouble, and there is very little question that if the cause had been removed at the right time there would have been very little irregularity. When I suggested the importance of having the nose examined and the natural air-passages made clear, it seemed to be a new idea to them, and they were much surprised that their physician had never suggested anything of the kind. A consultation with a rhinologist later resulted in the removal of a

large quantity of adenoid growth; the arches were afterward enlarged and the teeth all brought into position, thus making a wonderful improvement in the features. This is not a very uncommon case. What we want to do, invariably, is to get at the causes of these troubles, have them corrected early, and thus prevent the necessity for undertaking orthodontia operations. It is difficult sometimes to make the parents realize, before the fact, that irregularities are going to occur, and that much might be saved by early and preventive measures.

Referring to the case described by Dr. Smith as specially exemplifying the much-disputed theory of too large a jaw for the size of the teeth, or *vice versa*, it seemed to me to be a case of too large a tongue for the mouth, or one having too much muscular action—a case of more pressure inside than resistance outside—so that protrusion and spaces between the teeth have resulted. I think if those teeth could have been brought into proper position at the right time, and the cause removed, they would have been in correct position today; but it is a question to my mind whether at adult age such treatment would result in permanent benefit.

A similar case came under my observation some years ago. It was that of an adult in whom, as the result of a habit of pressing the tongue firmly against the lower teeth, these teeth had been forced outside of the upper ones, and spaced badly. The patient was unconscious of the habit until I called her attention to it as a possible cause. Careful observation later convinced her of the truth of my diagnosis. The teeth were brought in satisfactorily upon the elimination of the cause.

The point I have particularly endeavored to bring out is the importance of an early recognition and removal of the causes which lead to these irregularities.

Dr. ROGERS (closing the discussion). I have very little to add beyond saying that I am immensely pleased with the discussion, and that my object in writing the paper has been attained. It was not my intention to discuss the various sub-

jects very extensively, because I believed that there would be men in the audience who could better discuss these subjects. I find great differences of opinion prevailing among dentists, and consequently it becomes necessary for each one to discriminate in favor of the opinion which to him may seem the most logical. We are living in a progressive age, and we must accept the opinions of recognized leaders in our work.

I tried to point out that the time to correct malocclusion is when we become convinced that such a condition will become established, and therefore our object should be to promote interstitial growth, as I maintain that when we find it lacking we are sure to encounter malocclusion of the permanent teeth. In cases of mouth-breathing due to adenoids, or nasal obstruction of any kind, normal development of the jaws—from the lack of use—is never attained. It seems to me that the one way to prevent malocclusion in the very young is the immediate re-establishment of normal conditions, so that the jaws may become the seat of those forces which shall cause their full development. Faulty respiration should be corrected, and the child encouraged in his efforts to re-establish the normal respiratory function, then normal development will follow. Dr. Ainsworth has answered in part Dr. Smith's argument regarding the inheritance of large jaws and small teeth. I am going to add to what Dr. Ainsworth has said, that probably in this case there was lack of lip pressure as well as an abnormally large tongue. I noticed also that the cast showed an abnormal frenum labium.

Now, it was not my intention to enlarge upon the question of heredity, because I felt that Dr. Smith has strong ideas regarding it. I therefore simply alluded to it in my paper, and with the suggestion that possibly we overestimate heredity in its influence upon malocclusion. We must be careful in studying the causes of these disturbances, and give due recognition to each; it does not do to jump at conclusions; and we should consider environment the

factor in a great many of the deformities and malformations which exist in the human race.

Regarding some of the pictures: I am sorry that we cannot always have everything as we wish in the taking of these pictures, and I regret that some of those present noticed the manner in which the hair was dressed rather than the improvement in the teeth and facial lines.

Motion was made and carried to adjourn until the Thursday morning session.

THURSDAY—*Morning Session.*

The meeting was called to order Thursday morning at 10 o'clock by the president, Dr. Barrett.

The first paper on the program was that by Dr. S. H. GUILFORD, Philadelphia, Pa., on "An Appeal to the Younger Men of the Profession," as follows:

AN APPEAL TO THE YOUNGER MEN OF THE PROFESSION.

Anyone who has pursued the practice of dentistry for a sufficient length of time to have gained experience, who has kept in touch with the dental world in its broader aspects, and who has given the matter careful and serious thought, must admit that the great need of the profession today is more general intellectual activity.

Those of us to whose lot it has fallen to visit and meet our professional *confrères* in various sections of our country—both those old in practice and those just beginning; students in colleges and those in middle life—cannot fail to have been impressed with the limited horizon of a large proportion of very estimable practitioners.

Their lives have been useful; they have served, and are serving, their communities well; they enjoy the esteem and gratitude of those whom they serve, and yet the fact remains that as a class they have expended their mental and physi-

cal energies too largely within the narrow confines of office practice.

This criticism is not made in any capacious spirit; it is not prompted by the pessimism that sometimes creeps in upon those whose better part of life lies behind them, but it is the result of years of careful thought and close observation. More than once we have heard from the laity the expression: "Dentists are nice people, but they are narrow." The remark carried a sharp but unintentional sting, and it was all the more irritating because it was more than half true.

In thus giving expression to an unpalatable truth, we are not unmindful of the large number of men who have graced our profession with their high intelligence, broad mental grasp, extensive learning, and creditable incursions into the domains of science, art, and literature; for without them and their self-sacrificing labors, dentistry would not have made, in one century or less, the wonderful advancement of which we are all so justly proud. History will do them full justice, but it is not a comforting thought to realize that their places are not being filled in as large a measure as the growth of our profession would seem to warrant.

Among the younger practitioners of today there seems to exist an apathy or lack of desire to make some return for the rich heritage of the past. Once out of college, they bend every energy to the acquirement of a practice that shall fill all the hours of the day, and this accomplished they rest content and feel that they are fulfilling all of life's mission. They lack ambition to lead a higher professional life by contributing to the general professional welfare in the way of mental effort or self-denying labor. Their horizon appears to be bounded by the four walls of their offices, and they are unwilling to devote their evenings either to scientific research and literary effort in the line of their vocation, or to civic or humanitarian work outside of it. By thus confining themselves to routine professional work, they cease to broaden and develop as they should, and

this gives the world occasion to stigmatize us as "narrow."

We are speaking of the masses, not the exceptions, for among the latter there are those who do their part as best they can in local and general society work, on dental examining boards, and sometimes in the colleges. Some few pursue a special line of research or experimental work, and embody the results obtained in valuable contributions to professional society literature; but these are not many when compared with the membership of a profession such as ours.

College chairs today are filled largely by men who came upon the scene when dentistry was young, and journals are edited and books written by men past middle life. Who are to take their places when the day of retirement comes? Are the younger men of the profession preparing themselves to step in and carry forward the good work? We wish we could answer affirmatively, but we cannot. It is really a matter of great concern, for these places must be filled, if not by the qualified, then by the unqualified.

Dentists as a class are noted for love of their calling, for hearty good-fellowship, and their willingness to labor along certain lines for the common good of their profession; but we must confess that we do not see a general desire among the younger men to work along intellectual lines, and thus place our profession in a more favorable light before the community at large.

Perhaps the commercial spirit is at work, leading practitioners to be satisfied with a money return for their labors. Possibly it may be a lack of true, philanthropic feeling, coupled with a disinclination to over-exertion and self-denial; but most probably it is an absence of ambition.

Those who in the past have added to our store of knowledge by experiment and investigation; who have devised appliances that have lightened our labors; who have thought out the methods by which many of our practical problems have been solved; who have written our

books, taught in our colleges, and edited our journals, have been men who were actuated by a desire to benefit their professional brethren, and were ambitious to place our calling on a broader and higher plane.

They were willing to burn the midnight oil, and knew full well the meaning of self-denial and sacrifice. Their chief reward has been a consciousness of a duty well performed and the lasting gratitude of those whom they have benefited.

What higher reward could anyone ask?

Are there not among the younger members of our profession those who are willing to qualify themselves for work along the same lines, and who will be satisfied with the same reward? We certainly hope so, for there must be many who, by temperament, mental training, and natural gifts, possess latent possibilities of covering a larger field of human endeavor than the more restricted one in which they now labor.

Let the younger men realize that they owe a debt to their profession that should be paid. Let them feel that the good work which has been and is now being done unselfishly by others must be carried forward, and let worthy ambition stimulate them to earn for themselves the commendation of their fellows by earnest, self-denying labor, which, while it will bring them no money return, will be compensated for by the gratitude of those who come after them.

Discussion.

DR. L. D. SHEPARD, Boston, Mass. I consider Dr. Guilford's paper an ably written one, very comprehensive so far as it goes, and very true. I am sorry that the essayist, in his desire probably to make the paper brief and not overstep our patience, did not elaborate a little more, and answer some of the questions which he has asked. This he could do much better than I, without doubt. If I am to add anything to the foregoing approbation of the essay I must attempt to make it more complete by supplying what the writer was moved to omit.

There are two main ideas in the paper: The first is, that as a profession we need broadening; and that is true. Dr. Guilford does not give us the reasons for this condition, nor the way out of it.

Now, there are many reasons for this narrowness. They have existed throughout the growth of the young profession, and they exist today. Conditions, however, have been gradually improving, although there is yet a vast field for reform. In my opinion, the fundamental cause of our narrowness is the fact, which I think you will all admit, that those who have entered the dental profession in the past—and in recent years to a less degree—have been deficient in fundamental preliminary intellectual training. The dental college has taken boys from the grammar school and from the farm, many of them poor writers and a few poor spellers—uneducated men—and has tried to make professional men out of them; the material upon which the college has worked having been poor, it has been necessarily handicapped. What foundation for broad culture have we when the fundamental training which a man should possess before he enters upon his professional study is wanting? Other causes may and do exist for this narrowing, but my opinion is that reformation and improvement must come through the demand by the colleges for higher preliminary educational requirements. What other professional school is there in which preliminary examination has not been higher and more thorough than that usually required for matriculation in a dental college?

The other thought in this paper seems to me of tremendous importance for the future. I recall as one of the pleasant remembrances of my life the love and earnest devotion to professional progress of the army of noble men who have passed on, or most of whom have passed on. Where do we see today the spirit of Atkinson, Taft, McQuillen, Morgan, and a score of others who, twenty, thirty, or forty years ago, were my friends; who labored unselfishly with the true missionary spirit for the elevation of their pro-

fession, and the results of whose efforts remain with us today? As the essayist asks, Where are the men who shall take the places of those who are now laboring in the same spirit for the furtherance of progress? Only a day or two ago the chairman of the executive committee of the Metropolitan District Society, which numbers between two and three hundred members, came to me and asked if I could help him to devise some scheme by which the meetings of the society could be made sufficiently interesting to call out a larger attendance than thirty-five, which was the number present at the previous meeting.

Now, attractive meetings have been made possible in the past throughout the country by two means. One is by the importation of professional talent of high reputation coming from a distance, the expenses being defrayed by the inviting society; and the other, by the showing of instruments and appliances in a salesroom, which will add profit to the treasury of the society and attract the crowd. The combination of the intellectual attainments of foreign members and the commercial idea, or the yielding to the commercial spirit, is what seems to attract the crowd. I have always regarded this latter as deplorable. I have never approved of it, and while I do not know any way to avoid it, think that an exhibition hall in connection with a scientific meeting is a disgrace to the profession, and should never exist. What broadening influence can we have when the gathering of a crowd depends on what takes place in the adjoining exhibition room? I say I do not know any way out of it at present, when the commercial spirit is so rife, but there should be some way by which we may get the scientific men together in the society rooms.

The other way to attract the crowd, as I said, has been by talent from abroad. If you will take this program and look over it, you will find that out of the two or three hundred members of the Northeastern Dental Association, not one of the active participants in the intellectual part of the program today is a member of

this association. Some of the men appointed to discuss the papers are members of the society, but the papers are all imported talent. It is good talent, and I do not find any fault with it, but where are the Northeastern men, who ought to be the leaders here, whom we wish to listen to for the sake of what they have to say, and who will attract the crowd through their ability and devotion to the cause of dentistry? I went over the membership list of the Northeastern Dental Association in my preparation for opening this discussion, and I found that there were only six out of these several hundred who possessed the evidence—in the form of a collegiate degree—of having received a classical training. I found in the list one hundred and fifty-two graduates of dental colleges and sixty-eight who have no professional degree, making a total of two hundred and twenty active members. In addition to the six who possess the A.B. degree, there is one who has received the honorary A.M. degree on account of his scholarship. Quite a large number from among the one hundred and fifty-two who are graduates of dental colleges received their degree after they had been in practice many years. That is perfectly honorable and honest. They felt the need of further education; closed their offices, went to college and graduated, and have continued their work. And a good proportion of the sixty-eight non-graduates are old practitioners who belonged to the old Merrimac and the Connecticut Valley societies many years ago—when it was not so customary to go to college as it is now—and who have remained in the society; and it is no discredit to them that they do not possess a degree. These statistics are instructive, and I really hope that the young men will see to it that they shall answer this question by better effort in the future.

Dr. A. J. FLANAGAN, Springfield, Mass. This question of education brings to my mind a former resident of Philadelphia, a man, for instance, who was a seer, who was thoughtful, and who above

all respected the man and the manhood in the very material things we have talked about since I have been a member of dental societies. That man was the late lamented Dr. Garretson, who made dentistry and oral surgery his main life-work, and yet found time for the logical and the philosophical in life. He is the author of this quotation: "A thing is to the sense that sees it as to that sense it seems to be," and I firmly believe that were Professor Garretson here today he would say that the subject under consideration is to Dr. Guilford's mind, to Dr. Shepard's mind, to the speaker's mind, as it seems to be to the mind of each of them. It depends on how we look at it. In other words, dentistry is to the man that sees it what to that man it seems to be.

There have been a great many pertinent points raised here today. I do not know whether I can now be considered one of the young men, as I have passed the fortieth-year mark. Some famous teacher on education has made this remark: "Education begins at the cradle and ends at the grave," and were Dr. Garretson here today he would say: It goes beyond that; education is to one man one thing, and to another something else, and so on. In the discussion of this important question of education we are in my opinion losing sight of many fundamental principles. The first fundamental principle is that the medical school, the law school, the dental school, each has to educate a product that has been previously brought to a mature condition of mind, of body, and even of soul. But are the dental, medical, and law schools responsible for the mental training of their students prior to matriculation?

Now, starting on that premise, there are men who have the commercial spirit imbued in them, and others who have within themselves the soul-making qualities, long before they come to the dental college. We are liable to think that a college is represented by the buildings, by the chairs, and by the equipment, and that only material things go to make it

up, but does that constitute the college? Is not the college rather that something of an abstract nature from which develops manhood or those qualities which go to make the ideal man? The commercial student will carry away the material idea—at least will carry away that intangible something that counts for the base materialism of later years; and the colleges, gentlemen, as I said before, are not responsible for that result.

Comparisons, they say, are odious, but I am going to say here this morning that the comparison of dentistry to medicine is not always odious. I have been listening for years to the many complaints against dentistry as compared with medicine. To the weakling, the other fellow always has the best of life's good things. Somebody has said that the dental degree is the badge of partial culture. I tell you that it has a lot of company in the medical and in the legal degree. Think you that the shining lights in medicine represent the majority of the minds of medicine? Not at all. We are liable to think of the best the other fellow has, and we unconsciously call to our minds the best that is in medicine. I have had the honor of having acquaintance with many medical practitioners on the hospital staffs of various institutions, of being directly connected with some, and of debating and reading essays at medical meetings, and I want to say from my experience that the average men at those medical gatherings are no higher in the requirements of their calling than the average men who attend dental gatherings. We have in the medical profession many men who have not the A.M. or the A.B. degree, and we have some in the dental profession who have these degrees; but, gentlemen, stop and compare the number of dentists with the number of physicians practicing in the United States.

One other thought in relation to this—and this comparison I must credit to Dr. Kirk. Medicine is supposed at the present time to include rhinology, laryngology, ophthalmology, and many other "ologies" too numerous to mention. The

average medical man is given four years in which to gather this information, and goes out to practice a specialty or to a general practice with a supposed working knowledge of all the "ologies." What of the dental student? At the present time he is given three or four years for the study of merely his one specialty, and when one compares the attention and the amount of time at present devoted to the study of medicine, inclusive of all its specialties, if he be a man of ordinary ability, is he not more capable of practicing on the human race than is the average medical man? I defy any man here to produce evidence to warrant the statement that the general educational results are any less in dentistry than they are in medicine.

Another thing. Dr. Shepard spoke of the A.M. and A.B. degrees. A degree is the badge of training, but never of results. There are men who go through college and come out worse than when they went in. The A.B. and the A.M. degrees are badges of learning, the public certification of having had a certain amount of training in college—not the certification of results. Now, that being the case, there are many men without the A.M. and A.B. degrees whose education starts at the cradle and ends at the grave: men whose achievements and worth no degree yet brought forth could stand sponsor for; men who have educated themselves to the higher life—and have even that intangible something of great worth that Dr. Shepard called culture. "The rank is but the guinea's stamp, the man's the gowd for a' that." I want to say again, most emphatically, that education comes not primarily because a man has been through an institution. We see young men trying to come up the ladder about which we have been told so much. One of the greatest crimes is not to recognize the work and attainments of young men who show a willingness and ability to work in dental societies. If a young man or an old man labor in any capacity for the uplifting of that which we call dentistry—I do not care if it be on the executive com-

mittee or on that "infamous" committee you call the exhibit committee—if that man shows certain desirable qualities, then we should give to his efforts the proper degree of recognition. I do not even care whether he has an A.M. or an A.B. degree. I will say, however, that I do not find many A.M. and A.B. degree men doing what I denominate the hard scrub-work in dental societies. Young men are many times stultified in their best efforts by dishonest thoughts and criticisms. Sometimes personalities enter into this antagonism to rising young men. If a man shows ability in the little things, then is it not safe to presume that he will show ability in the greater things?

Someone has said that commercialism is rampant in dentistry, but, gentlemen, commercialism is no more rampant in dentistry than it is in other professions; commercialism is rampant throughout the country, not in dentistry alone. We are deceiving ourselves along that line. When a man is on a committee and does good work on that committee, we should appreciate it, and when there is a vacancy in a higher office, if that man has labored well, appoint him to fill it, and do not take instead someone who has done nothing.

In closing, I want to say that when we have honored a man with the highest office in the gift of the society, his appreciation of that honor is best shown when he returns to the meetings year after year and works faithfully, in whatever capacity offered, for the welfare of his calling. We have had men in various parts of New England who possessed the A.B. and A.M. degrees, who have been presidents of dental societies, but I know of only one who has since, always and ever, been working for dentistry—his name is Shepard.

I wish to say here that our friend Dr. Guilford is still a young man in this respect. He comes from a place where all men are young in dentistry—ever working with energy. Men who come from Philadelphia, wherever you see them, are vitally interested in the devel-

opment of dentistry. Dr. Guilford has been honored with the highest honors that the societies can give him, but he is today willing to and does labor in subordinate positions. We must remember last, but not by any means least, that before dentistry, before education, comes character-building; and when we succeed in bringing out in a student the qualities that constitute character, we have reached the ideal in education, general or professional.

Dr. EDWARD C. KIRK, Philadelphia, Pa. I wish to express my thanks to the essayist for bringing this subject before us and for saying just what he has said in his paper. The subject is one which for many years has seemed to me to be of the utmost importance, and it is certainly well worth while for us to give it the time necessary for its thoughtful consideration. I agree heartily with all that the essayist has said in criticism of our tendency as a profession to become narrow-minded, or perhaps if I should say to remain narrow-minded, it would be nearer the truth. I have, I am sorry to say, been compelled to this view from experience and careful observation, and I have often wondered whether dentistry itself exerted a narrowing tendency upon the minds of its votaries.

I shall never forget my first experience as a young lad in coming in contact with a dentist. The occasion was a social, not a professional one, yet I must admit that it impressed my mind quite as vividly as did my subsequent experience, when I some time later submitted myself to his professional ministrations. But my first introduction to a real live dentist was at an evening social gathering, where the gentleman in question was the center of an interested group, upon whom he was shedding the radiance of one of those professional or technical smiles—enhanced in its effect by a shining row of porcelain dental substitutes that, according to Oliver Wendell Holmes, made his smile "a glittering welcome, a mineral benediction to all beholders." He was enlightening his hearers upon the subject of dentistry and

making frequent allusion to "bicuspid," and as my memory serves me he talked about nothing else. I had never heard of bicuspid before, and what they were I did not know, but I became convinced that they were of the utmost importance; indeed, all other things in the universe seemed to dwindle into insignificance in comparison with bicuspid, as I listened to the learned professional discourse. In the years that have supervened I have realized that bicuspid are really important, but I have also learned that the Almighty has created other things of importance besides bicuspid, and that His universe does not necessarily revolve around, upon, nor because of bicuspid.

I take it that the paper to which we have just listened is a plea for a larger view of things and a broader culture than is to be found within the technical limits of our specialty; a recognition of the fact that life holds something worth knowing and worth living for besides dentistry. The man who imagines otherwise and who, acting upon such a belief, confines himself exclusively to the study of things dental, is giving himself a narrowly one-sided mental development. His education is comparable to that of the athlete who exercises but one set or group of muscles.

The essayist suggests that the lack of tendency to a broader development in our profession may be due to the prevalence of the commercial spirit among us. Let us not make any mistake about this. I do not know how the author of the paper defines the "commercial spirit," but there is a kind and degree of commercial spirit that is admirable and worthy, and it should be cultivated in professional life as in any department of human activity; by which I mean that every man is justly entitled to fair compensation for the energy, intelligence, and skill that he expends in the pursuit of his calling. He should expect and demand the reward for such service, for it is his duty to maintain himself and those who are rightfully dependent upon him. To that end he should make money, for otherwise he becomes depen-

dent himself and a parasite upon society. The mistake is this: It too frequently happens that some forget that money is to be properly regarded as a means to an end only, and they make money-getting an end in itself, which, as a narrowing and soul-destroying process, is without an equivalent.

But dentistry in and of itself has been criticized as having a narrowing tendency. The danger of such an effect is rather apparent than real. It is narrowing if one forgets that other activities furnish the ways and means toward acquiring the same sort of mental satisfaction that many find only in dentistry. The principal source of the satisfying quality which, as I take it, so many dental practitioners find in the details of their professional work, is the pleasure they derive from the accomplishment of a purpose—the doing of things that they originate and can do well and perfectly. It is the satisfaction which Goethe has called the "creative joy." Such work becomes narrowing in its tendency only when done to the exclusion of all other work, which is equally capable of furnishing the same sort of satisfaction to the creative sense. One is broadened in his mental and psychic scope as he cultivates the possibilities within himself for doing things. More than that, his capacity for enjoyment is correspondingly increased by the discovery of these latent powers within himself and the putting of them to active use.

Some of my friends are getting considerable amusement at my expense because I have just recently learned the trick of successfully sharpening a razor, and because in my enthusiasm over this newborn acquirement I am pleased when once in a while some humorously inclined friend brings me his old dull razor to put in order for him. But, as a matter of fact, I am the one who really gets the most fun out of the transaction, not because I have an inordinate fondness for sharpening dull razors, but because I have discovered that I have within me a new-found ability to do a thing well that I did not know previously

I could accomplish at all, and I have been getting as much pleasure out of it as a child does out of a new kind of toy. I wish we could get into the minds of our educators and our students the fundamental idea that it is the chief end of education to develop the latent powers of the individual, both mental and physical, so that he can make the most of them in his life-work—that thus the acquisition of knowledge may have back of it a normal stimulus in the idea that education is a means to an end, and that end the making of a useful citizen; not that study is a necessary system of drudgery which must be gone through with in order to pass examinations.

I regret that the graduates of American high schools, who are recruiting the ranks in dentistry, come to us so deficient in a clear working knowledge of their mother tongue. It is discreditable to our system of preliminary education that so few of its products know the meaning and structure of English words. I recently asked my class the meaning of the word "matriculation," and no one ventured an answer, yet all had matriculated. As teacher and editor I grow tired of hearing about "Laudable puss" and similar monstrosities which would not be possible if thorough drill in English has been enforced in the preliminary educational period.

Europeans as a class and of analogous educational grades know their mother tongue better on the whole than American high-school graduates do theirs; at least that has been my personal experience in coming in contact with a large variety of nationalities for the past dozen years. We spend more than enough time on preliminaries; what we need is more thoroughness and more intelligence in the use of our time.

I apologize for speaking at such length, but I know of no subject of more importance to dentistry than that presented by the essayist, and I trust that it may continue to receive the consideration to which its importance entitles it.

Dr. GUILFORD (closing the discussion). Dr. Shepard was correct when

he said that I had omitted a number of points upon which I might have dwelt in the paper. This was done because the paper was necessarily brief and was merely a cursory statement of the case. When I was invited to write a paper requiring from five to ten minutes to present, I realized that it would be a very difficult task to perform, as it is much easier to write one requiring from twenty to thirty minutes; and in order to limit myself, I found it necessary to condense the paper as much as possible. I think those who know me give me credit for being a concise writer, but in this case I had to exercise all my powers of condensation in order to keep within the time limit. There are a number of things I wanted to discuss but I could not do it in the time allowed.

In regard to the subject I have chosen, we have it on very good authority that a man should be able to give a reason for the faith that is in him. Varying that a little, I think there should be for every paper an impelling motive—something that leads a man to select a subject and treat it in a particular manner. What I have written and read to you today has been on my mind for a long while, and yet there never seemed to be a proper occasion upon which to present it, but I concluded that with the audience I should probably have before me here in Boston, it would be appropriate to bring up the subject and have it discussed. The question may be asked, Why has this matter made such an impression upon me? It is for the reason that for years I have been trying to get some of the young men in the profession interested in college work particularly, and have met with very little success. The men whom I selected—those men who had the benefit and advantage of early education, and who possessed the mental qualities that should make them teachers, writers, or workers—when I approached them upon this subject met me with the reply, "What do I care for these things? I can make more money in my practice." And that is why I spoke of the commercial spirit

—so many being willing to be satisfied with what they earn at the chair, and who do not seem to have any sense of responsibility, or any ambition outside of their daily toil.

It seems to me that any man who has reached the period of middle life or gone beyond it, and has not made provision in the way of life insurance or investments to support those dependent upon him in the manner in which they have been accustomed to live, is not the highest type of man; and if that be true in general life, is it not true also in professional life? Do we not all owe a debt to those who are to come after us? Is it not our duty to contribute of our time and talents toward the uplifting of our profession, and to constitute it a heritage worthy of being bequeathed to our successors? No one has a right to live unto and for himself alone.

One other point. In my younger days, and in my innocence and love for the profession, I believed that dentistry stood upon as high a plane as any other calling in the world, and I lived under that impression for a great many years, until finally I came to realize that outside of the profession and outside of the people I have met or associated with, there prevailed a different opinion. Somehow or other there was a bit of stigma attached to the practice of dentistry—not justly, but still it was there. Some years ago a professional friend crossed the ocean with his wife on his way to Europe, and after his return he told me that when on board the vessel they met several people who seemed to take very kindly to them, and who were disposed to be sociable, but just as soon as it became known to them that he was a dentist, they dropped him. Now what did that mean? It did not mean a reflection upon his intelligence or character, because they had not had any fair opportunity to judge of them, but they were influenced by a popular prejudice, and the simple fact that

the man was a dentist caused them to avoid him. Occurrences like these are sometimes met with. For years I would not believe it—I could not realize it.

The way to destroy this prejudice is for all to strive for higher ideals; to develop all the powers that are within us, and to do that in our lives and in our work which will tend to give the world a better opinion of us. Many are doing good work, but the great majority are not doing what they might, and if I could by any means in my power induce the young men in dentistry to broaden their influence in the direction of literary and educational work, I would be glad to do it.

Some years ago I was attending a banquet given in honor of Dr. Miller of Berlin, and sat beside one of the prominent educators of Pennsylvania and of the country. One of the speakers was referring to the great attainments of Dr. Miller—what he had done, what the results had been, etc., when this gentleman turned to me and said, "Why do not more of the men in the dental profession work along similar lines?" I stated many reasons, giving as one, close application to work and weariness at night; and also that perhaps many were not qualified. I said that I was not qualified to carry on scientific investigation, having had no training in that direction. "But," he said, "have you not been active in society work?" I replied, "Somewhat." "Have you not contributed to the literature of the profession?" I said, "A little." "Have you not written a book or two?" I said, "Yes." "Well," he said, "you have done your part. I am not speaking of that, I am speaking of the men who have not done anything outside of their practice." This college professor, though not a dentist, saw what was lacking in the dental profession, and if all dental practitioners could see matters in the same light that he did, it would probably lead to much good.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, AUGUST 1907.

EDITORIAL DEPARTMENT.

THE EDITORIAL PREROGATIVE.

ABOUT once in so often some over-zealous individual with an assumed or imaginary grievance gets before a dental society with a recital of his ideas on the question of dental journalism and the iniquities of its present mode of conduct, and he takes up the time and attention of his hearers with a critical recital of what he doesn't know concerning that topic. Usually this type of criticism comes from individuals who for one reason or another have had a proffered communication returned as unavailable—that is to say, it was rejected, refused publication by the editor of a journal; in short, the critic under consideration has come into personal contact with that which for lack of a better designation has been called the editorial prerogative.

We confess that it is neither a flattering nor a pleasant experience to have an article rejected when offered for publication. To the man who is capable of reasoning judicially such an

occurrence will be taken at its face value and will excite no more resentment than the facts may properly warrant, and none at all if the editorial explanation, which is always available upon request, is a reasonable and satisfactory one; indeed, it may be turned to profitable account and to the writer's benefit later. There is, however, the type of mind that is not judicial in its attitude toward such an event, nor indeed toward any event that runs counter to its over-developed ego, and in such instances the experience under consideration rankles and breeds a vindictiveness which expresses itself in the rôle of the self-constituted martyr or reformer, and sometimes of both.

For more than a generation past, at various times and places and by many different individuals, the subject of "trade journalism" has been a favorite theme for the exhibition of the spirit of vindictiveness to which we have referred. Pretty nearly all the crimes in the professional calendar have been charged against the journals published by dental supply houses; every wrong-doing, each symptom of professional degeneracy, professional competition, the defects in dental education and dental legislation, the commercializing of dentistry, its low standard of ethics, have all and severally from time to time been charged to that same source.

During sixteen years of continuous service in the conduct of the DENTAL COSMOS its Editor has studiously avoided reference to or recognition of the slanderous utterances of these uninformed and misguided critics. He has, however, noted that in not a few instances—indeed, it may safely be said the majority of instances—where the DENTAL COSMOS has been directly included in these attacks, they have had their origin in the animosities of those who for good and sufficient reasons have been refused the opportunity to exploit certain of their communications in its pages. The usual result of such an incident has been that the dental world was shortly thereafter instructed as to how a dental journal ought to be conducted, and the pressing need of a dental journal conducted by the dental profession so that everybody might have his say therein without let or hindrance.

For the information of those who seem to sorely need it let it be known as to the DENTAL COSMOS—

First: Its text pages are not controlled by any supply house, but are controlled absolutely and exclusively by its Editor.

Second: The Editor is personally and individually responsible for what appears in its text pages.

Third: The Editor, and he alone, is responsible for the exclusion of objectionable matter from its text pages.

Fourth: The Company publisher of the DENTAL COSMOS has no knowledge or concern as to what shall or is to appear in its text pages or as to what has been excluded therefrom.

Fifth: The Editor for upward of thirty years has made dentistry—its social, professional, technical, political, educational, and legislative features—a special and continuous study in its local, national, and international aspects, and as the result of this experience deems that he has laid the groundwork for an understanding of his professional duty.

Sixth: The Editor conceives it to be his duty to eliminate from the DENTAL COSMOS all libelous and slanderous matter, and he promptly rejects all communications involving such illegal and unethical utterances, whether they be directed at or emanate from persons or corporations.

Seventh: The Editor rejects all articles that are essentially unethical in fact or by implication, and in his concept of "unethical" he includes that fundamental concept of ethics so generally disregarded by many who would consider themselves ethically damned for using or recommending "Mrs. Winslow's soothing syrup," but who do not for a moment consider it unethical to bear false witness against one's neighbor.

Eighth: The Editor will not admit to the pages of the DENTAL COSMOS polemical articles which transcend the limits of courteous debate by indulging in insulting personalities. If writers of papers and those who discuss them desire to apply such critical terms as "fakir," "fraud," "dishonest," "grafter," *et id genus omnes*, to persons or corporate bodies of persons in expressing their personal opinions of them, they will have to find other channels of publication than the DENTAL COSMOS.

We have felt called upon to make the foregoing explanation for the reason that recently two marked instances of flagrant violation of what we regard as the essential spirit of the ethical code with respect to these matters have come to our notice: one a paper read before the Central Association of Northern New Jersey by William Cummings Fisher, D.D.S., New York city, and subsequently published with the discussion thereon in July *Items of*

Interest, and the other the remarks of G. B. Squires, D.D.S., at the recent meeting of the Massachusetts Dental Society, forming part of its transactions not yet published.

The first is an arraignment of the so-called "trade journals," and is a magnificent specimen of the type of paper which is always rejected by the DENTAL COSMOS because upon its internal evidence it proves not only that its author does not know his subject, but that he has had the temerity to draw upon his imagination for his data and consequently has placed himself upon record as stating much that is not true. We have no contention with the author of the paper referred to regarding his desire for a dental journal national in scope published under the auspices of the National Dental Association and conducted precisely as that body may desire to conduct it. But we take exception to his misstatements of the truth concerning the "control" and "censorship" of dental literature by supply houses, and his implication that what he is pleased to designate as the "trade journal" is "subservient to the interest of its publisher" in any such sense as the essayist clearly implies.

Evidently Dr. Fisher has developed professionally to a point where he can be no longer benefited by the thought of his colleagues as expressed in the periodical literature of dentistry, for he asks concerning the dental journals, "How many of them can you read with pride and with profit?" But, notwithstanding his toplofty position, it is palpably evident from his paper that he has rushed into print with a string of inaccurate statements, some of which bring him perilously near to the misadventure of inflicting a compound comminuted fracture upon the ninth commandment, which he could have easily avoided by going to original sources for his data and confining himself to a discussion of facts rather than of fancies. One fact he has, however, referred to—viz, that this journal did decline to publish an article from a writer to whom he alludes; and it did so in accordance with the principles specifically defined in the earlier part of this editorial—principles which will continue to govern its editorial policy without regard to the personality of its contributors or would-be contributors.

Dr. Squires' communication involves an arraignment of this and other dental journals because of what he assumes to be their attitude toward the nostrum evil, his charge being that the Cosmos

is timid in attitude because it refuses to print his utterances on this question—which utterances are in the opinion of our counsel libelous in character. We are quite in sympathy with any movement of a legitimate character which will tend to correct or eradicate the evils of the nostrum business, and we have never refused publication to any temperate or legitimate discussion of that question; but we do refuse to print libelous matter, for these two reasons: First, because, it being libelous, its printing is an infraction of the law of the land, and we therefore object to its publication on moral grounds. Secondly, we decline to lay ourselves open to action for damages in a libel suit for no other reason than to give an over-zealous speaker or writer the opportunity to record his peculiar views at our expense.

There is a perfectly legitimate method by which the question of the nostrum evil may be discussed, but not in the hot-headed, not to say hysterical, manner in which it was recently treated by the editor of the *Journal of the American Medical Association*, whose editorial has furnished so great an inspiration to Dr. Squires, and the republication of which he does not seem to know would lay us open to action for libel equally with its original publisher. Dr. Squires accuses us of timidity, and in his virtuous enthusiasm even goes so far as to suggest a boycott by the profession of the *COSMOS*, *Digest*, *Items of Interest*, etc., if advertisements that do not meet his specified standards are found in their pages. But it is or should be pretty generally known that the Editor of the *DENTAL COSMOS* inaugurated the first practical attempt to uncover the evils attendant upon the use of local anesthetic nostrums, in 1893 (see vol. xxxv, page 354), and its policy with regard to the advertising of these objectionable agents is or should be well understood by those who essay to express their opinions upon that point, as the attitude of this journal is clearly set forth editorially at page 158 of vol. xxxiii, page 723 of vol. xxxvii, and elsewhere. No proprietary preparation finds a place in its advertising pages unless its composition is known substantially in accordance with the same standards as recently specified by the ruling of the American Medical Association. Further, we would respectfully inform Dr. Squires and any who hold to his doctrines that there is a vast difference between timidity and an unwillingness to incur the pains and penalties of an infraction of the libel law upon his individual account; and as to boycott—well, we shall

continue to publish the DENTAL COSMOS as heretofore, using the best resources at our command in order to produce the best dental journal of which we are capable, and should Dr. Squires or any who share his views wish to discontinue their subscriptions because of the offensiveness of the DENTAL COSMOS to their ethical sense, they can doubtless find someone willing to lend them the issues as they appear, and thus enable them to continue their reading of it incognito and with a sense of unsullied ethical propriety.

We regret the necessity for bringing to the attention of our readers a subject which is so personally related to the conduct and attitude of this journal; but a statement of our position is in our opinion clearly called for, in view of the criticisms and mis-statements to which we have referred. We do not impugn the motives of these critics. We believe as they do that it would be a wise plan for the dental profession of the United States to publish a professional organ under its own management. We should be glad to see the experiment tried, and would give it all the support and encouragement within our power; but we would favor the exclusion from its management of all who by their acts and utterances indicate that their ideal of successful dental journalism is a policy of faultfinding and criticism of the journals that for the time being are earnestly and conscientiously endeavoring to subserve the best interests of the dental profession.

TWO GREAT MEETINGS.

WE take pleasure in offering our hearty congratulations to the officers and committees of the National Dental Association upon the splendid work accomplished by them as set forth in the official program of the eleventh annual meeting, to be held in Minneapolis from July 30th to August 2d. The quality and character of the program are excellent, and the topics forming the subject of essay treatment are not only of varied interest, but they deal with questions of peculiar importance at the present time. It is indeed gratifying to note such an excellent array of papers, indicating a more thorough and general awakening among us as to the importance of searching out the deeper meaning and scientific bases of our professional work.

The array of clinical material is imposing both in extent and in kind, so that the seeker after further enlightenment, whatever may be the character of his special field of activity in dentistry, cannot fail to derive benefit from what the Minneapolis meeting offers to him.

If the attendance be at all commensurate with the character and attractiveness of the program, the Minneapolis meeting should surpass all of its predecessors in importance. We trust that such may be the case, for the officers and committees have done their part nobly and well, and it is for the profession to show its appreciation of this great effort by a goodly attendance.

Our readers have been kept in touch with the progress of organization of the Jamestown Dental Convention through our columns and by the whole dental press of the country. The Committee of Organization has labored strenuously to create an attractive program, and its efforts have been eminently successful. The Jamestown Convention will present features of attractiveness quite distinct from any previous professional gathering of dentists. The meeting will not be overburdened with formal papers; the clinics and exhibits as set forth in the official program present novel and attractive features, so that from the purely professional side there is more than ample justification for the hope that the convention will be an abundant success.

But, in addition to the professional part of the program, there is the social aspect of the affair—a feature which in the present instance is a factor of large importance. The convention is to be held in one of the historic cities of the South, one largely concerned during its Colonial days with the shaping of the fabric of our national republic; the convention will be in proximity to the Jamestown Exposition at a time when that interesting exhibit will be seen at its best; and while both the exposition and the convention will reach international dimensions with relation to the interests which they respectively engage, nevertheless it is a southern movement, mainly under southern influences and in a southern environment—all of which is directly translatable into southern hospitality. The world has heard of southern hospitality; many have been so fortunate as to experience it. Those who have will need no further inducement

than the occasion offered by the Jamestown Convention to renew it; those who have not had that pleasure have missed something of a liberal education in kindness, generosity, and genuine good will—a defect which they should hasten to repair on the occasion of the Jamestown meeting in September.

Let everyone who can possibly do so go to Jamestown and learn for himself the real meaning of southern hospitality, and enjoy a dental meeting that will well repay the effort made to attend it.

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THE AMERICAN POCKET MEDICAL DICTIONARY. Edited by W. A. NEWMAN DORLAND, M.D., Editor "American Illustrated Medical Dictionary." Fifth Revised Edition. 32mo., 574 pages. Philadelphia and London: The W. B. Saunders Co., 1906.

A review of Dr. Dorland's major work, the "American Illustrated Medical Dictionary" appeared in the issue of this

journal for December 1903, page 985. Several of the suggestions on the meaning of dental terms contained in that review of the parent work has been incorporated in the pocket edition, the subject of this notice. As a medico-dental dictionary the work should be included in the library of every dental student.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*La Stomatologia*, Milan, July 1906.]

A CASE OF AMAUROSIS CONSECUTIVE TO THE EXTRACTION OF A TOOTH. BY DR. SANTAMARIA.

The case reported by the author was that of a soldier who, prior to enlisting, had followed the occupation of portrait painter.

Six months after his arrival at the Florence barracks he suffered from a violent attack of pulpitis in the upper right first molar, which tooth, being badly decayed, was extracted at once.

A few hours after the extraction the patient again suffered from a neuralgic attack, the pain radiating from the right cheek to

the eye of the same side, and from a rapid and progressive diminution in the visual power of the right eye, which very soon became amaurotic. This condition lasted five days, and ceasing abruptly was followed by intense amblyopia. An examination showed that the visual field had decreased on both the right and left sides, to a greater extent in the former than in the latter, and that there was in addition an intense dichromatism for the blue and red primary colors. An external examination revealed nothing worthy of note; in the mouth no pathologic lesion could be seen, excepting perhaps a slight degree of hypo-esthesia.

The author's own conclusions upon the peculiarities of this case are that the amblyopia was not of reflex nature, as is often the case with dental neuralgia; that the dichromatism is an interesting feature of the case, by virtue of the previous occupation of the patient; that the amaurosis and the dichromatism confirm the fact observed by Trombetta, viz, that the symptoms exhibited by those affected with traumatic neurosis become in preference localized in those organs which for each patient are of pre-eminent importance in his daily occupation; that the nature of the traumatism was entirely out of proportion to the severity of the consecutive neurotic manifestations; that even the most insignificant stimuli may be followed by serious and unexpected consequences in the case of neuropathic patients.

[*Zahntechnische Wochenschrift*, June 1907.]
INVESTIGATIONS ON THE EFFECT OF HIGH TEMPERATURE ON TEETH. By PROFESSOR WACHOLZ AND DR. VON LEPOWSKI.

The effect of high temperature on the teeth is a subject which has been rather neglected, notwithstanding the fact that opportunities for practically testing the value of such knowledge have not been lacking in recent years. After the disastrous conflagration of the Bazar de la Charité in Paris in 1897, in which hundreds of lives were lost, the authorities and relatives of the dead had to resort to the teeth in the endeavor to identify the victims. A more recent fire, relatively as distressful in its effects upon human life, was that of a train of cars near the railway depot of Offenbach. It was

shortly after the latter accident that the authors decided to investigate the resistance of the teeth to high temperatures. Their researches have established the fact that in teeth indirectly subjected to a high heat—namely, those with which the flames do not come in contact—the enamel preserves its color and natural luster, and that under similar conditions the long bones are completely carbonized. Teeth directly exposed to the flame will in a short time burst into a number of small fragments, and those subjected for a relatively long time to the action of a very high temperature are completely decalcified—preserve their form, but collapse as soon as touched.

The investigations concerning the resistance of filling materials were carried on by filling a number of teeth *in situ* with several filling materials, afterward placing the skulls in ovens built of fire-clay. Gold, platinum, and porcelain teeth resisted the high temperatures satisfactorily, as did gold bridges and crowns. Fillings of porcelain and cement proved themselves unchangeable by heat, the latter gaining somewhat in hardness. Amalgam fillings were so completely acted upon that no trace of them could possibly be found after removal of the skulls from the oven.

[*University of Pennsylvania Medical Bulletin*, Philadelphia, May 1907.]

PRESERVATION OF DEEP SENSIBILITY OF THE FACE AFTER DESTRUCTION OF THE FIFTH NERVE. By R. H. IYR, D.D.S., M.D., AND L. W. JOHNSON, M.D.

The authors state that up to a comparatively recent period it was considered that all sensory impulses of the face were carried by way of the fifth nerve, while the seventh nerve was concerned solely in the motor supply of the muscles to which it runs. Recently, however, the opinion has been gaining ground that we must modify this teaching to a considerable extent, and the purpose of the paper is to present some facts in support of the changed conception of the nerve supply of the face. After quoting the observations of Head and Sherrington, the authors allude to the cases reported by Spiller, in which the Gasserian ganglion having been removed, the deep pressure sense in the area of the fifth nerve remained, while all other forms of sen-

sation were lost. It has been noticed, not infrequently, that after operation on the Gasserian ganglion, or the sensory root of the fifth nerve, some sensation has been retained in the side of the face operated upon—a condition due, according to the authors, not to incomplete removal of the Gasserian ganglion, or section of the sensory root, but to the fact that a considerable area over the lower part of the cheek receives sensation by way of the cervical nerves, and to the possibility of confounding pressure sense with tactile sensation.

The case which stimulated the authors to undertake the study of facial sensation was that of a man aged twenty-five years, in the service of Dr. Spiller in the University Hospital, and in whom, notwithstanding the total destruction of the right fifth cranial nerve, pressure sense was not destroyed on the right side, and sensation was preserved along the border of the lower jaw in the area presumably supplied by the cervical nerves.

In another case under Dr. Spiller's care a year ago, the sensory root of the fifth nerve was cut because of the great pain from a tumor involving the Gasserian ganglion. The destruction of the fibers was made certain by the necropsy. The sense of touch was entirely lost over the area of distribution of the fifth nerve, while the sense of pressure was retained.

Cryer has reported three cases of peripheral operations upon the inferior dental nerve for trifacial neuralgia, in which pain on the inner surface of the mandible and floor of the mouth was not relieved by section below the point at which the mylo-hyoid branch was given off. A second operation above the point of junction of this branch with the inferior dental nerve was followed by complete relief, thus showing that the mylo-hyoid branch, which supplies motor fibers to the mylo-hyoid and digastric muscles, also conveys sensory impulses from these muscles.

From the cases studied and the facts recorded throughout the article the authors have reached certain conclusions which they sum up as follows:

(1) The fifth nerve conveys fibers of sensibility to light touch, changes in temperature, and pain, from those parts generally recognized as being within the area of distribution of the said nerve.

(2) The seventh nerve conveys fibers of

deep or pressure sensibility from the muscles which it supplies with motor fibers.

(3) The muscles of mastication which derive their motor supply from the fifth nerve probably are also furnished with fibers of deep sensation by that nerve.

[*l'Odontologie*, Paris, June 15, 1907.]

ON ARTIFICIAL LARYNXES. BY L. DELAIR, PROFESSOR AT THE ÉCOLE DENTAIRE, PARIS, FRANCE.

At the Fourth International Dental Congress, held in St. Louis in 1904 (see Transactions Fourth I. D. Cong., vol. iii, p. 165), the author presented, through Dr. Godon, a report containing a detailed description of an artificial larynx which he had constructed for a patient on whom Dr. Sebileau, an eminent Paris surgeon, had performed a total laryngotomy. Since then Dr. Delair has somewhat improved the original appliance, and has successfully reproduced it for six patients, all of whom had undergone total or quasi-total laryngotomies. With the aid of Dr. Delair's apparatus the patient deprived of his larynx is able to readily articulate sounds and words almost from the moment it is inserted.

[*Le Laboratoire*, Paris, June 7, 1907.]

TWO CASES OF ALOPECIA CONFIRMATION OF JACQUET'S THEORY. BY DR. MONNIER.

The first case was that of a lady aged sixty years, neurasthenic, in whom an extended area of baldness appeared on the nape of the neck on the left side. A dermatologist having failed by medicinal means to bring about the desired result, advised the patient to have her mouth and teeth examined by a dentist, stating that the localized alopecia could be caused by a diseased condition of the teeth. In spite of her incredulity, the patient sought successively the services of three dentists, each of whom performed some minor operation, one of them extracting a lower left third molar. As conditions did not improve, and as a measure of last resort the services of Dr. Monnier having been enlisted, a thorough examination of the mouth and teeth was made by him, with the result that apart from a suppurating socket—that of the lower left third molar, the tooth that had been extracted a short time previously—no other

evidence of pathological conditions could be detected. An exploration of the socket showed at once that a fractured root was the immediate cause of the pyogenic discharge. The antiseptic treatment of the socket soon caused the disappearance of the suppuration, and about a month afterward an active growth of hair could be seen in the area of circumscribed alopecia.

The second case was that of a man who, having suffered several years before from alopecia, was directed by his physician to consult a dentist. As the patient could not devote the necessary time in order to have a diseased tooth properly treated, this was extracted, the operation being followed soon afterward by the disappearance of the alopecia. Recently this same patient suffered from an attack of pulpitis, followed by the reappearance of an alopecia zone. This time he consulted Dr. Monnier, who successfully treated the affected tooth, its recovery being followed by a gradual growth of hair in the bald area. To this case the author calls special attention, inasmuch as it clearly shows the relationship which exists between dental lesions and that reflex action of the trifacial nerve responsible for trophic disturbances in the scalp or in its immediate neighborhood.

[*Trans. Odontological Society of Great Britain*, April 1907.]

SOME OBSERVATIONS ON THE BACTERIOLOGY OF PYORRHEA ALVEOLARIS.

BY HAROLD SIMMS, M.D., CH.B., L.D.S.

Although a great deal of experimental work has been performed on this subject, we are still unable to determine the particular agency responsible for the causation of those forms of chronic suppuration grouped together under the name pyorrhea alveolaris. It has been quite conclusively shown that among suspected organisms which are capable of ready cultivation, there is none that occurs with anything like sufficient regularity to suggest its having any causative action, and even in those cases in which there is a large amount of pus the proportion of occasions on which the common pus cocci are present is extremely small, and it may justly be inferred that the usual suppurative bacteria have little, if any, relation to pyorrhea.

The author has examined, both clinically

and bacteriologically, twelve typical cases exhibiting the pyorrheal condition in different stages. The clinical history of these cases showed such previous general constitutional influences as influenza, rheumatic fever, diabetes, syphilis, and, in one case, a persistent state of low vitality following confinement. A blood-count was also taken in each case, and although anemia was present in all but one case, it was not of so profound a type in any case as has been reported by K. W. Goadby (see *British Medical Journal*, 1905, pp. 68-74). Under the microscope the pus from these cases showed the presence of every conceivable variety of bacteria—cocci, bacilli, spirilla, vibrios, and thread-like organisms. Small diplococci, which represent the streptococcus brevis, are always present, but as they have no pathological significance they may be neglected. Groups of staphylococci may also be invariably seen, but their presence is revealed to much greater extent in culture tubes. A few vibrios and spirals can usually be found in healthy mouths, but in any inflammatory condition their number becomes very much increased, and this is particularly well marked in cases of pyorrhea. While bacilli of every size and shape were met with, the investigator draws particular attention to the very large forms, quite unique in appearance, known as fusiform bacilli. Vincent and Simonin of Paris have commented on the association of spirilla and fusiform bacilli in some of the pseudo-diphtheric affections in the throat, and particularly in the tonsils. In each of the twelve cases examined by Mr. Simms the association of these two forms was observed, especially the fusiform bacilli, which persisted after active periods of treatment. These rods taper to a point at each extremity and are exceptionally long, attaining often a length of fifteen microns; they are frequently slightly curved, and a close examination sometimes reveals the presence of transverse striping or vacuolation.

The author describes in detail his cultivation experiments, and those carried on with the view of determining the virulence of the several organisms. Nearly all of the organisms isolated were introduced into guinea-pigs, but most of them proved to be quite innocuous, except the spirillum already referred to, which caused the death of the animal in

five days, without, however, any signs of suppuration.

The varieties that caused abscesses to appear were the typical pyogenic cocci and those staphylococci which the author has designated as atypical, because they do not conform to the usual culture or staining reactions. One of the guinea-pigs, into which pyorrheal pus in broth was injected, appeared likely to die, but recovered with a marked paralysis of its hind limbs—a point in favor of the supposition that there is a toxic element in pyorrhea.

In concluding, the author states that the opinion held by many that pus-forming cocci in pyorrhea are of so little importance that they may be neglected is not tenable at all, for there undoubtedly exists in these cases a variety of cocci which, although differing in certain technical respects from the usual type, are yet as truly pyogenic as the others. With regard to the association of the spirillæ and fusiform bacilli, it is the belief of Mr. Simms that these types of bacteria are capable of setting up those initial changes in the gums and periosteum that are so typical of pyorrhea alveolaris.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, March 30, 1907.]

THE THERAPEUTIC SIGNIFICANCE OF THE SILVER SALTS. BY DR. WILKE.

In this important communication the author, after referring to the several organic and inorganic compounds of silver which may be successfully employed in general practice, states that of the soluble salts of this element collargol has the strongest antiseptic power. It comes in the form of small, easily breakable, black masses having a metallic luster. It contains eighty-seven per cent. of pure silver and is soluble in twenty parts of distilled water, thus making it possible to prepare solutions up to five per cent. in strength. It has been used with satisfactory results in the treatment of mixed infections such as diphtheria, tuberculosis, the remote manifestations of influenza, etc.

The internal use of collargol is especially indicated in cases of general infection, although it should be added that it is of little or no use in the case of the patient whose heart or vaso-motor apparatus is in an exhausted condition, or where the infection is

not present in the constituents of the blood, or in tissues not directly reached by the circulation. Crédé, who has made a thorough study of this compound, has found that the free silver which becomes disengaged in the blood-current exercises strong bactericidal properties without inducing the slightest toxic effects, and that in addition, it stimulates the phagocytic activity of the larger leucocytes. Its use is followed by no perceptible after-effects, and it has never been known to cause argyria, nephritis, or emboli.

[*British Dental Journal*, May 1, 1907.]

A CONTRIBUTION TO THE ETIOLOGY OF TOOTH-GERMINATION. BY ARTURO BERETTA, M.D., OF THE INSTITUTE OF PATHOLOGICAL ANATOMY OF THE ROYAL UNIVERSITY OF BOLOGNA, ITALY.

According to Magitot, the pathogenesis of gemination can be traced to the coalescence of two dental folliculi. This coalescence, he wrote, may lead to the gemination of two teeth in all their length. If the gemination be produced in the crown only, it must arise from the union of the enamel organs—with, further, persistent separation of the roots. When, on the other hand, the roots are geminated, the union of the folliculi takes place after the normal development of the two crowns. Finally, when two teeth distant from each other unite, the phenomenon is due to lesions or anomalies of the maxillary bones as to their relations, rendering two folliculi which were normally distant from each other contiguous, and which have consequently united.

Cadwell, after having observed in a few cases that dental gemination was accompanied by deficient development of the maxillary bones, thought that it might be brought about by want of space during development, the folliculi being in contact with each other and heaped up, as it were, causing absorption of the follicular tissues.

While this theory explains the etiology of some particular cases of gemination, it cannot be adopted as a general rule. Dr. Beretta has examined several abnormal skulls for deficient development of the maxillary bones, without noticing a single case of gemination. The many different theories offered with reference to the gemination of other organs often fall before the evidence of isolated facts.

We are aware that an inflammatory process having set in in any part of the system may, owing to its extent and mechanical action, displace cellular elements in their reciprocal relations, and therefore the author is led to believe that a localized inflammatory process producing alterations in the cellular areas of two contiguous follicles may be the constant etiological factor.

Considering that in the study of this subject experimental work is particularly difficult, whatever conclusions may be reached must be viewed in the light of inductions rather than that of established facts. However, it may be stated that delayed development and absorption of the intermediate parts, owing to deviations and pressure, are the most frequent causes. These several factors must be considered as the causative forces in a general way, for in specific cases either cause might seem the more likely. When the teeth geminate preserving their

direction and normal axes, as well as their regular dimensions, the cause may be attributed to the non-development of the inter-follicular septum. When the gemination is more or less angular, when the different parts are disproportionate and abnormal in their further evolution, deviations and forces of an inflammatory origin may be diagnosed. The gemination process is easily explained in the case of lack of inter-follicular tissues. During their formation the organs consist of young cells in active proliferation, and in this stage the fusion of separate parts is a feature of normal development. It can therefore be readily seen that organs which should normally remain independent will unite when abnormal conditions during the embryonic period cause them to come into direct contact with each other, as was shown by Bönn, who experimentally demonstrated the extreme facility of obtaining the union in embryo of parts of the larvæ of the batrachia.

PERISCOPE.

To Clean Cement Slab.—To clean the cement from a glass slab, dip a pellet of cotton in twenty-five per cent. sulfuric acid and wipe over the surface; then wash it off clean.—A. D. BARBER, *Dental Summary*.

Thymocamphene.—As a disinfectant canal dressing, to two drams each of thymol and phenol one dram of camphor gum is added. Mixed in a dry test tube, and fused with low heat, the camphor thoroughly dissolves, and the result is a stable liquid at ordinary temperatures.—*Dental Register*.

Cement in Combination with Absorbent Cotton as a Sealing Dressing.—A happy method which I have followed for some years, where cement is used to seal medicaments in teeth under treatment, more especially when devitalizing pulps, is to incorporate in a thin mix sufficient absorbent cotton to produce a mass slightly less in size than the cavity. This is easily placed without pressure on the pulp, and more easily removed than when cement alone is used. Try it.—JOSEPH LOHAN PRASE, *Pacific Dental Gazette*.

To Replace Tooth on Temporary Plate.—Having occasion to replace a tooth on a temporary plate, I did not wish to be put to the trouble of vulcanizing, so I repaired it with oxyphosphate cement, with which I mixed a very little rouge. The color can be altered to suit.—A. D. BARBER, *Dental Summary*.

Factors to be Considered in the Selection of Filling Materials.—The character of material as to indestructibility, accessibility of the cavity, temperament of the patient as to fortitude in having dental operations performed, conditions in the mouth as to susceptibility or immunity, the probable stress to which the filling is likely to be subjected in mastication, the present condition of the teeth as to sensitiveness, the present condition of the patient as to nervousness, the condition of the peridental membrane, the extent of decay in the individual tooth to be operated on, the number of teeth involved—all of these enter into the question and should be considered. There is also one other factor which sometimes has a bearing on the case, but which is not often enough considered, and

that is the attitude of the patient toward dental operations at the particular time when the work is to be done. For instance, the patient's teeth may have exhibited a long and persistent tendency to decay, and the attempt to save them has entailed a serious physical, nervous, and financial tax. At such a time, if new cavities occur, the outlook is so disheartening that to subject the patient to extended or expensive operations is bad judgment, and tends to the temptation in some instances to let the teeth go by default, or at least to resort to crowning. Under these circumstances the operator should aim to make the burden as light as possible by the selection of some material which may be easily inserted, and which will not involve much expense.—C. N. JOHNSON, *Dental Review*.

Preparation of Amalgam for a Filling.—To make a strong filling, and one that will have close margins, get first the right proportion of mercury. Mix and work the material until the mass is smooth and plastic. It should then take the finest skin markings of the fingers. Continue the kneading until the first slight evidence of stiffening becomes apparent, and then make the filling quickly. It should stiffen at once on being pressed into the cavity, so that it will not draw back from the walls when the instrument is withdrawn, or move again when more material is pressed upon it.—G. V. BLACK, *Dental Review*.

Obtunding Sensitive Dentin in Gingival Cavities.—Prepare a saturated solution of thymol in alcohol. Take a pledget of cotton (size of the cavity) and immerse it in the liquid; then slightly warm it over an alcohol lamp, and place in the cavity. Retain the dressing in the cavity with pliers, and with a hot-air syringe throw warm air on the cotton, until the preparation has become evaporated. Remove the cotton and proceed with the shaping of the cavity, which you will find can be successfully performed, inflicting little or no pain upon the patient. Try it and be convinced.—F. J. MOYER, JR., *Dental Summary*.

A Porcelain Catechism.—The crowns of all natural teeth are—when in a normal condition—composed, in a sense, of layers of colors. There is a pink or red center—the pulp. Then the next layer is the dentin, which is of about an ivory color. Then all is covered with enamel—the third layer—in which predominate, I would say, white and gray. It seems reasonable to suppose that we can attain the best results by imitating

nature, not only in contour and shade, but also in the physical arrangement of the colors. Inlays made with a core of foundation body which is as near as possible the color of the dentin, covered with enamel bodies which are also as near the shade of the natural enamel as possible, should, and will, produce a good appearance, surely much better than those made by attempting to mix the bodies in the endeavor to obtain a mixture of the exact shade of the tooth. Many inlays can be made to match more closely the natural tooth by placing in the bottom of the matrix a little gum enamel, which will give an indefinite, pinkish cast to the foundation body placed over it; or a brown lining in badly discolored teeth, and sometimes a pure white is indicated, like Brewster's cavity lining.—W. A. COSTON, *Western Dental Journal*.

Selection of Filling Material for and Treatment of Children's Teeth.—The materials for filling deciduous teeth are limited to those easy of insertion and not too exacting in their manipulative requirements. When cavities occur in the approximal surfaces of the incisors, they are usually better managed with zinc oxyphosphate than with anything else. They are ordinarily shallow, and the fact that they are frequently quite sensitive prevents the operator from giving them any appreciable retentive form. Cement can therefore be used when nothing else will remain in place. These teeth do not often call for much operative interference, owing to their early loss to make way for the permanent incisors, but with the deciduous molars the case is different. They remain four or five years after the incisors are gone, and the problem of saving them when they decay is sometimes exceedingly difficult. Simple cavities in the occlusal surfaces of these teeth are not difficult to manage. They may be filled with zinc oxyphosphate, copper oxyphosphate, pink base-plate gutta-percha, or amalgam, as is indicated in the individual case. Amalgam is more reliable than any of the others, provided the cavity does not reach too close to the pulp and is correctly prepared, but sometimes we are obliged to temporize with cement or gutta-percha.

The most difficult problem we meet with in the management of deciduous teeth is to properly treat cavities occurring in the approximal surfaces of the molars. There are several factors in these cases tending to make them troublesome to control. They are usually sensitive, making them difficult of proper preparation for the retention of amalgam,

which is the only permanent material we have for preserving these teeth. Unless fillings are reasonably well anchored in these cavities, they are likely to be loosened by the impact of mastication, and if we attempt too deep an anchorage we are likely to approach the pulp. In fact, these teeth do not usually present much area of tooth tissue in which to form a cavity, and it takes but little penetration of decay to involve the pulp. It is always best to avoid irritating the pulp if possible, and to this end it is frequently advisable to use some other kind of material than metal to fill them with.

In pulpless deciduous molars the case should be treated in the usual way, except that some care should be taken not to introduce medicines which have a disagreeable taste or odor. It is always desirable, with children, to avoid as much as possible anything which tends to create prejudice against having dental operations performed, and usually these deciduous cases may be brought under control by the use of the essential oils—which are less objectionable than some of the most powerful antiseptics. Oil of cloves seems to be one of the best for this purpose.—C. N. JOHNSON, *Dental Review*.

Dental Vital Statistics.—In vol. xxvii of the Proceedings of the Thurgau Natural History Society, Dr. Brodtbeck of Frauenfeld gives an interesting account of the causes, results, and treatment of caries, from which the following statistics (some of which, of course, are well known) relating to children may be again epitomized: Cunningham examined 10,517 children in Scotch schools, of an average age of twelve years. He found 32,279 decayed teeth, and only 1508 children with perfect dentures. Pedley examined the teeth of 3145 English children and found 22.5 per cent. with perfect dentures. In Szegedin, Ungvari found among 1000 children, between the ages of six and twelve years, 87.5 per cent. with defective mouths. Läuffer in Minsk found 80 per cent. of caries in the pupils of the gymnasium. In Hamar (Norway) 600 children between the ages of six and fifteen years showed 2441 decayed teeth out of a total of 15,246. In Copenhagen, Westergaard found 97,508 decayed teeth among about 10,000 school children. In Germany, Lipschitz examined 407 pupils between the ages of six and sixteen years, and found only three with perfect dentures; out of 9432 teeth only 6509 were not attacked; this was at a girls' school. Fenchel, in Hamburg, found at the town orphanage twelve perfect mouths among 335 children—2½ per cent. of

the boys and 5 per cent. of the girls were free from caries. Further investigation by the same observer, at the normal school, showed that of 663 pupils, 98 per cent. of the girls and 97 per cent. of the boys suffered from caries. In a Hanover public school Kühn found that only 32 out of 374 children passed the stringent test. In Halle, Römer found 236 perfect dentures among 3942 children. In Elberfeld, Vörkel found 5 per cent. of the children free from disease, and in Witten, Weber found 9 per cent. free. At Strasburg, Jessen, whose name deserves to be mentioned with honor, found 4.3 per cent. of sound dentures. Röse, another dentist of renown, examined 30,000 children in South Germany, and found 4.5 per cent. of the boys and 3.2 per cent. of the girls free from caries. In Frauenfeld, Brodtbeck found 1205 out of 2500 teeth decayed when examining the children of the first and second primary classes, i.e. children of seven and eight years of age. In 1901 he, together with Dr. Röse, undertook an examination of the teeth in three districts of Thurgau, and passed as having perfect dentures 1.2 per cent. of the boys, and 0.5 per cent. of the girls.—*British Dental Journal*.

A Bardless Richmond Crown.—In the construction of this crown the tooth is prepared as for a Richmond crown. Cut a piece of pure gold, about No. 40 gage or heavier, of a size that will cover the root, and leave a margin all the way round, and a good length at the lingual aspect of the root. Burnish this piece over the root slightly, and then remove and cut a hole in it a little smaller than would be required for the pin to pass through it; replace the gold, after selecting a suitable pin, and force the pin through the gold into the root as far as may be necessary. Remove the gold with pin, and solder with 20-k. solder; then replace the pin and gold, which are now in one piece, being sure to leave the pin extending out of the root and gold, so that when the impression is taken the pin will become engaged in the plaster. After replacing the pin and gold hold the pin firmly in the root, and with a flat or suitable instrument burnish the gold well on the root until the root-margins appear on the gold. Remove and trim the gold to the root-margin, except at the lingual part.

Now remove, and with the shears slit, on the lingual side, this long piece to the root-margin as shown on the gold at this part; replace and burnish, or turn this back well against the lingual portion of the root, letting it extend into the free margin of the

gum against the root. Having fitted this well against the root, we are ready to take the bite and impression. The pin and cap should readily come off with the impression. Make the cast with plaster mixed with some investing compound and mount it on the articulator; select a suitable facing, and grind it to the root-margin, or where it shows in the gold on the labial side, leaving the sides of the facing extending a little beyond the margins at the sides of the root.

Before grinding the facing to place, the projecting portion of the pin can be cut or ground off. After the facing has been ground, the crown is waxed and invested. In waxing be sure to wax out to the end of the gold where it extends up on the lingual portion of the root. You invest and solder as usual with 18-k. solder, letting it run well upon this lingual part. After the soldering, the crown is finished to the root-margin, which shows on the gold very plainly. When this is mounted, it is sure to fit the root accurately and give practically as strong a crown as a Richmond, with no ill-fitting band extending into the gum to irritate and cause some trouble that will result in the loss of the tooth sooner or later. Platinum can be used in the place of gold, if preferred, as none of it will show.—J. C. LONGFELLOW, *Dental Summary*.

Burnished Joint for Porcelain Crowns.

—In setting the detached Logan or Davis crown, prepare the root in the usual way. After the root has been reamed out, place the pin in position and try on the tooth in order to get the correct alignment; if necessary, bend the pin, remove it, and cut a piece of fine gold plate, No. 36 gage, large enough to more than cover the end of the root. With the plate punch, perforate the center of the plate; replace it, and force the pin through the hole to position in the root; then burnish the gold over the edge of the root until it shows a well-defined mark made by the root-edge; trim it carefully to this mark, replace, and burnish it perfectly to the entire end of the root, dressing it off at any point where it may extend slightly beyond the edge of the root. When this is accomplished, with the pin and gold plate in position, fill the space with soft, salted plaster, allowing it to extend over the teeth on each side of the space; while the plaster is still soft, direct the patient to close the teeth and keep them in this position until it has set, thus securing the bite. Remove the plaster, which will bring the pin and gold plate away with it; run the cast, which will show the tooth in each side

of the space; place it in the articulator, and now run the cast which will show the opposing teeth. We thus have the pin, gold plate, and teeth on each side of the space, together with the occluding teeth, in plaster. The porcelain crown may then be ground to fit the gold plate and articulated very satisfactorily. When ground to position, cement the crown to place; after the cement has set, remove the plaster, and the operator has a crown ready to set, with a burnished joint between the root and tooth, the gold being so thin that it is quite imperceptible, and the joint as perfect as can be made for any inlay. —D. T. HILL, *Dental Brief*.

A Displaced Tooth in the Nasal Cavity Causing Fetid Vomiting.—An unusual case of great diagnostic and anatomical interest was shown by Dr. Glas at one of the recent meetings of the Vienna Medical Society. The patient was a lad aged nineteen years, who, when a child, had fallen violently on his nose. He complained of very fetid eructation, with occasional vomiting of green, foul-smelling masses. The examination of the sputum, feces, and a test breakfast gave no clue to the cause of this. In the nose, however, a curious condition of things was found. Between the left lower and the middle turbinated bone and the septum there were greenish yellow, gangrenous, fetid, friable masses, which indicated the presence of either a foreign body or an ulcerated neoplasm. After considerable difficulty and much bleeding, a hard body was found and removed. This proved to be a canine tooth, which undoubtedly had been pressed into the nasal cavity by the fall already mentioned. The examination of the teeth of the patient showed the absence of the canine tooth, no interval existing between the first premolar and the lateral incisor of the left side. After the removal of the rhinolith the fetid vomiting ceased at once. The case is a great rarity, only two similar instances of displaced teeth forming rhinoliths having been recorded hitherto. In this patient the vomiting of the green masses was so difficult to explain that serious abdominal disease was suspected.—*Dental Surgeon*.

Appropriate Filling Materials for Nervous Patients.—In cases of extreme nervousness of the patient, or unusual sensitiveness of the teeth, zinc oxyphosphate and gutta-percha may be employed with good results, provided they are used with the limitation always in view that they cannot be depended on for extended service in the majority of in-

stances. The practitioner should always make a careful study of his patient, and should aim to fit the character of his operation to the necessities of the case, avoiding, if possible, undue nervous strain. It is not a very elevating style of practice to fall into the habit of merely patching teeth up with plastics, pursuing this as a settled method of operating; but the plastics are extremely valuable as a preparatory means of checking the decay and protecting the teeth until the conditions are such that more permanent work can be accomplished. In doing this temporary class of work there is one combination of materials to which your essayist has frequently called attention, and which should be employed more than it is. In all large approximal cavities where the decay extends under the free margin of the gum, if zinc oxyphosphate be used, there is quite likely to be a solution of the

material at the gingival margin long in advance of a failure of the filling at other points. This sometimes causes an undermining of the filling, and a recurrence of decay in a region where the pulp is readily exposed, an accident which frequently happens before the patient is aware that anything is wrong, and while the filling is apparently in good condition in other places. To prevent this, gutta-percha should be used for the gingival third of such cavities and the filling completed with oxyphosphate. Gutta-percha will not dissolve out at the gingival region, and it is readily tolerated by the gum tissue. This combination makes a more permanent filling than either gutta-percha or cement does alone, and when failure begins by a wearing away of the exposed cement, it at once becomes apparent to the patient before recurrence of decay takes place.—C. N. JOHNSON, *Dental Review*.

HINTS, QUERIES, AND COMMENTS.

MAKING GOLD BANDS, CAPS, AND CROWNS WITHOUT SOLDER.

RECOGNIZING the principle that a thin piece of metal will melt in the flame before a thicker, led me to solder bands for crowns by slipping a very thin piece of gold—say from No. 60 to 120 foil—between the edges of the approximating ends of the band, after the ends have been sprung together; then with the blowpipe heat to almost the melting-point, and then direct the flame steadily on the thin piece of gold in the joint until it melts. Of course no flux is used before attempting to melt.

For making a cap. Fit the band snugly to a thin plate of gold, leaving an edge all around like the brim of a hat; then flux with the band down and plate on top, heat

up as before, and run the flame all around, melting the rim up to very near the band, when it will be found that the two pieces are firmly melted together.

For joining a cap to a band in all-gold crowns. Adjust the cap to neatly fit the crown by beveling the inner edge of the cap and the outer edge of the band—thus as it were telescoping one into the other; then cut a piece of very thin plate, having it large enough to extend a little all around the joint after it is adjusted between the band and cap, making a large air-hole in the center of the plate; flux and melt as for the cap.

With a little practice this process will be found easier than soldering, and it is almost needless to say it produces a vastly more sightly and stronger result.

CHARLES KEYES.

Rio de Janeiro, Brazil.

OBITUARY.

DR. JOHN I. HART.

DIED, suddenly, of angina pectoris, at his residence in New York city, on June 9, 1907, JOHN I. HART, D.D.S., in his forty-second year.

Dr. Hart was born August 7, 1865, in New York city, where his entire life was spent. He began his professional career as a student in the office of Dr. M. L. Chaim in 1881, being indentured to him for three years. He entered the New York College of Dentistry in the fall of 1884 and graduated in the year 1886, taking the gold medal for the highest standing in scholarship in his class. He early became identified with the work of the dental societies of his city and state, being a member and president of the Dental Society of the State of New York; a member of the First District Dental Society, of which he was president for two years; of the Odontological Society of New York, and a member of the National Dental Association, being vice-president for the East in 1896, and an active and valued worker. Being a clear thinker, the expression of his opinion always received the most profound attention of his fellow members.

Dr. Hart connected himself in a teaching capacity with the New York Dental School in 1895 as professor of operative dentistry and dental therapeutics, which chair he occupied at the time of his death, the name of the school having been changed previously to that of the College of Dental and Oral Surgery of New York. The college was admitted to the National Faculties Association in 1898, Dr. Hart representing the college in that body and serving it in several official capacities, being at the time of his death its president, the youngest man who ever occupied that

chair. As it has been said of one of his professional colleagues, so it may be truly said of Dr. Hart: "As a teacher he was at his best, his investigating turn of mind leading him to study his special field with earnestness and thoroughness. Every new device or method received his careful consideration, and his large experience and ripe judgment enabled him to collate and arrange his data and present the results to his students in an interesting and forceful way, which served to impress his teachings strongly upon their minds." Personally beloved by all his students, his strong, upright character and high ideals stood as an incentive to all of them to become ethical professional gentlemen.

Dr. Mendes very truly said, "The name of John I. Hart will be revered by many men for many things: For the considerateness of the true gentleman; for the conscientiousness of his every act and thought; for the genuine love and enthusiasm he evinced in his chosen walk in life, and for the uncommon zeal and industry which placed him, so young, so high among his peers and associates. These are mighty possessions which have made him famous. Then, too, for his sure intuition and comprehension, which, united to his lovable disposition and sweetness of character, made him such a valued friend—such a firm prop and support to those who needed counsel or encouragement. These are the possessions which have made him beloved." His taking away is a public calamity which will be long and keenly felt by his fellow practitioners of the city and state where he lived, as well as by his co-workers in the field of education, and all will remember with gratitude that John I. Hart lived, and that they knew and loved him.

R. M. S.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF SOUTHERN CALIFORNIA, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the University of Southern California were held in Los Angeles, May 28, 1907.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Clarence Roy Benney	Joshua Barnes Lape	James Robert Ross
Walter Roland Burbeck	Charles Edward Laufer	Tatsunosuke Shina
Howard Smith Duff	James Carson Magill	Reginald Boulter Skinner
Carl Oscar Engstrom	Beverly Bolling McCollum	John A. Somerville
Frederick Fitzgerald	Wallace Henderson McHargue	Percy Ford Spicer
Russell Wilbur Force	Eugene Edward Osenburg	William Francis Whelan
Harrison Bruce Harwood	George Lawrence Richardson	Claude Elmore Williams
Clinton Chappell Howard		

OHIO COLLEGE OF DENTAL SURGERY.

THE sixty-first annual commencement exercises of the Ohio College of Dental Surgery were held at the Odeon, Cincinnati, May 9, 1907.

Addresses were delivered by Prof. C. M. Wright and Willard C. Gott.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Albert E. Beaver	Kentucky	Philip Adam Krucker	Ohio
Winfield L. Bixby	Vermont	Ernest W. Lent	Michigan
Adolph W. Boltz	Kentucky	John J. Maloney	Kentucky
J. Millard Bradley	West Virginia	S. David Marshall	Kentucky
Ambrose O. Buckingham	Ohio	William L. Mitchell	West Virginia
William A. Burdette	West Virginia	Pietro Amedeo Mondon	Italy
Carrie P. Canon	Ohio	William C. Pritchard	Kentucky
S. Virgil Compton	West Virginia	Francis M. Pursell	Ohio
Harry M. Crawford	Indiana	Arthur McQ. Ramsey	Ohio
Van Broadus Dakton	Kentucky	Floyd B. Richards	Kentucky
Joseph J. Devine	Massachusetts	Lee G. Rinehart	West Virginia
Solon Eagleson	Illinois	Clarence C. Risk	Kentucky
David K. Edwards	Ohio	Glenn A. Rothenbush	Ohio
Osborne P. Elias	Ohio	L. Elbert Rouse	Kentucky
William F. Goshorn	West Virginia	Albert Schwartz	Ohio
Lee C. Greenburg	Ohio	Arthur C. Sheets	Ohio
Earl S. Greenfield	Ohio	J. William Siegfried	Ohio
Wilbert Gories	Ohio	Charles E. Smiley	Ohio
Willard C. Gott	Ohio	Harry R. Smith	Ohio
Cicero M. Hall	West Virginia	L. Eugene Smith	Ohio
M. Halstead Hall	Kentucky	Murrell A. Stevens	New York
Theodore W. Harkins	West Virginia	Clara E. Stock	Ohio
D. Stanley Hill	Illinois	Frank E. L. Thomas	Kentucky
P. Leo Kearns	Kentucky	J. Dellis Thompson	Texas
Charles P. Kelleher	Louisiana	Harry J. Timmerman	Indiana
J. Lee Kelly	Ohio	Fred S. Wood	Ohio
Harry H. Kraatz	Ohio	Ivan W. Wright	Ohio

DETROIT COLLEGE OF MEDICINE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Detroit College of Medicine were held at the Light Guard Armory, Detroit, Mich., May 30, 1907.

Addresses were delivered by Prof. Theodore A. McGraw, M.D., LL.D., the Rt. Rev. Chas. D. Williams, D.D., L.H.D., and Irwin S. Hanna, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Mr. Sidney T. Miller, M.A., on the following graduates:

Earl C. Barkley	Michigan	Charles F. Klump	Michigan
Joseph E. Brady	Ontario	Samuel J. Lewis	Michigan
Charles R. Brooks	Ontario	Russell G. Miller	Michigan
Martin J. Cain	Michigan	Charles G. Saunders	Michigan
Albert A. Cook	Michigan	Wesley E. Schellig	Ontario
George A. Ferguson	Michigan	Charles A. Smith	Michigan
Robert J. Foster	Ontario	Estel L. Todd	Michigan
Chas. E. Frankfurth	Ontario	Fred A. Townsend	Michigan
Irwin S. Hanna	Michigan	John A. Van Loon	Michigan
Allan J. Jackson	Michigan	Arundel B. Wigle	Michigan
E. Theokles Johnston	Michigan	Albert B. Witte	North Dakota
Frank L. Kingan	Michigan	John T. Wray	Ontario

CHICAGO COLLEGE OF DENTAL SURGERY.

THE twenty-fifth annual commencement exercises of the Chicago College of Dental Surgery were held in the Garrick Theater, Tuesday, May 28, 1907.

Addresses were delivered by R. A. White, D.D., and Hart J. Goslee, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Truman W. Brophy, M.D., D.D.S., LL.D., on the following graduates:

Edward Porter Ahrens	Charles Henry LeFevre	William Aloysius Quinlan
Frederick Peter Baker	August Henry Lemke	Frederick Albert Randolph
Harry Barnett	Guy Leonidas Lemley	Sylvester Albert Ridley
Herbert Dickey Britan	George Clarence Lipton	John Heber Rockwell
Robert Brupbacher	Ira Esto McCarty	Dana Wayne Ross
Arthur John Casner	Albert Emmett McEvoy	William Edwin Russell
Theron Brown Childs	Joseph Mattingly	R. Dale Russell
Howard Wade Clarke	Frederick Carl Meyers	Joseph Ernest Schaefer
Chester LeRoy Cloes	Thomas Albert Montgomery	Frank Irvin Shaffer
Clarence Whitman Cox	I. Caldwell Morrical	Don Amos Shinn
Martin Henry Duffy	William Jerome Morrissey	Charles Mathews Smith
Clarence Henry Ellingsen	Morton Hanson Mortonson	John Mitchell Smith
William Charles Faust	Leslie Avison Muedeking	Arthur Garfield Snavely
Frederick Alfred Fidler	Carl William Mueller	Robert James Steven
Gualtiero Fiordelmondo	Raymond David Murray	Harry Lee Stratton
Robert Denton Gee	Ole Boe Nagelsaker	Benjamin Rush Sugg
Helmar Gustavus Green	Walter Louis Neely	Samuel Baugh Thatcher
William Eli Groff	Paul Nespoulous	William Irving Timmer
Ralph MacMurphey Havens	George Clinton Niles	Frank Henry Uppendahl
Harold Harlan Heiple	Walter Clement Noel	William Deitrich Vehe
Russell Neil Hill	William Norwood	Guido Allie Walther
Walter Smith Hoge	Edward Joseph Nourie	Ernest Dana Watts
Keron Jerome Holland	Antoine Joseph Oidtmann	H. Francis Watts
Morrell Winfred Hooker	Elbert Crosby Pendleton	Hymann Lawrence Weber
Robert Smiley Howe	William Henry Petty	Charles Enos Woodward
Arthur Fletcher Kenney	William Harry Porter	David Herbert Woodward
Ray Kirkpatrick	John Charmichael Purdie	William Ellis Zavitz
Frederick William Koehler	Albert Frederick Quick	Giulio Cesare Zunini

CINCINNATI COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of the Cincinnati College of Dental Surgery were held on Thursday, May 2, 1907, at Sinton Hall, Y. M. C. A., Cincinnati, Ohio.

The valedictory address was delivered by Dr. Otto Juettner.

The degree of Doctor of Dental Surgery was conferred by Prof. E. W. Wilkinson, president of the board of trustees, on the following graduates:

William L. Apple	Ohio	Jesse Leming	Ohio
Clarence A. Edwards	Ohio	Chas. A. Mauget, Jr.	Kentucky
John J. Hagen	Ohio	Harry L. Rosencrans	Ohio
William B. Laughlin	Ohio	Henry D. Truman	Ohio

HOWARD UNIVERSITY, DENTAL DEPARTMENT.

THE fourteenth annual commencement exercises of the Howard University were held in the First Congregational Church, Washington, D. C., Wednesday evening, May 29, 1907.

The degree of Doctor of Dental Surgery was conferred by President Thirkield on the following graduates:

Lucius A. Armstead	Marion Diggs	George W. Harry
Benjamin D. Boyd	Thomas W. Edwards	Lemuel A. Lewie
Oliver C. Cassis	J. William Ford	John L. McGriff
William F. Clark, Jr.	Charles R. Hargrave	Albert O. Reid
Amy L. Darrell		

VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE twenty-eighth annual commencement exercises of the Vanderbilt University, Department of Dentistry, were held in Nashville, Tenn., Saturday, May 11, 1907.

An address was delivered by George H. Price, B.E., M.S., M.D.

The degree of Doctor of Dental Surgery was conferred by Chancellor James H. Kirkland, A.M., Ph.D., LL.D., on the following graduates:

Raymond Millard Bright ..	Minnesota	George Houston Leyden	Alabama
Sanders Lee Butler	Illinois	Wesley Tucker Merritt	Mississippi
Thomas Cade	Georgia	John Arthur Perkins	Tennessee
Alfonso Frank Cook	Texas	James Wilbur Pigott	Mississippi
William H. Craig	Arkansas	William Bradley Price	Alabama
John Wesley Crutcher	Tennessee	Enoch L. M. Pruitt	Alabama
William Pleas Delafield ..	Texas	Fred H. Pryor	Tennessee
Charles G. Dillard, Jr.	Alabama	Herschel Biggerstaff Ray	Kentucky
Meriwether Rivers Donaldson	Tennessee	John Milton Ridley	Tennessee
Thomas E. Dunlap	Alabama	Charles Spencer Rockwell	Georgia
William Henry Ellis, Jr.	Mississippi	Herman Stanton Rush	Kentucky
Virgil Dubose Frizell	Mississippi	William Albert Sheetz, Jr.	Tennessee
Clarence Spencer Fugler	Mississippi	Sam Ryall Sholars	Texas
Hawthorn Moran Fuller	Alabama	James Walter Stephens	Arkansas
David Samuel Gardiner	Tennessee	Royal Harold Stewart	Mississippi
John Perrin Glenn	South Carolina	William Franklin Stone	Tennessee
Albert Manderville Gregory	Tennessee	Houston King Templeton	Tennessee
Charles Stuart Harkins	Alabama	Simeon S. Waits	Louisiana
Newton Harris	Tennessee	James Watson	Texas
Joseph William Jones	Alabama	Frederick William Whitehurst ..	Tennessee
W. J. Lamb	Kentucky	Arnette P. Williams	Alabama
George Washington Leslie ..	Alabama		

NEW ORLEANS COLLEGE OF DENTISTRY.

THE eighth annual commencement exercises of the New Orleans College of Dentistry were held in the Crescent Theater, New Orleans, La., May 14, 1907.

Dr. E. B. Craighead, LL.D., delivered the annual oration.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

A. A. Aycock	W. L. Dillard	A. J. Legendre	J. T. Reese
J. A. Buisson	St. C. Duke	J. F. Love	W. H. Smith
I. W. Bush	W. J. Givens	M. E. Ludwick	J. T. Webb
R. C. Cailleteau	F. L. Guidroz	J. W. Miles	J. H. Wiley
G. F. Carman	J. S. Huhner	C. E. Mixer	R. A. Wilson
J. D. Carter	G. J. Hullinghorst	E. R. Musso	F. N. Winbery
E. L. Demaree	H. A. Jeanmard	G. M. Provosty	T. J. Wingrave

UNIVERSITY OF ILLINOIS, COLLEGE OF DENTISTRY.

THE sixth annual commencement exercises of the College of Dentistry, University of Illinois, were held in Handel Hall, Chicago, Ill., May 31, 1907.

The doctorate address was delivered by Rev. Edward B. Crawford, and the valedictorian was Joseph Atwood Dunn, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Edmund Janes James, Ph.D., LL.D., on the following graduates:

Thomas A. Ashworth	Henry A. Frey	James Steele McCreight
Walter E. Becker	Abraham N. Halperin	Maynard M. Marquis
Ezra T. Clark	Aaron Bloom Harris	Lawrence B. Murphy
Carleton Cleveland	William B. Hendricks	Waleryan Waclaw Nowacki
Benjamin B. Cronk	Thomas E. Hoover	Leroy Henry Phifer
Dorsey Boatman Davis	Joseph Elmer Jacobs	Alexander A. Shore
William John Dierks	Maurice Lasker	Joel Isschar Singer
Ralph B. Driver	Samuel A. Levin	Harry T. Spangler
Joseph Atwood Dunn	Bradley F. Lockwood	Johanne C. Thomson
Leo J. Fels	George Ernest Lyons	George William Wheeler
Clarence L. Foley	Thomas J. McCarthy	Anthony J. Zimonth
David A. Frankel		

COLLEGE OF PHYSICIANS AND SURGEONS, DENTAL DEPARTMENT.

THE annual commencement exercises of the College of Physicians and Surgeons were held June 6, 1907, at the Van Ness Theater, San Francisco, Cal.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Harry Lee Aikins	Carl Otto Forester	Daniel Francis Mulvihill
Margaret Janet Bell	Charles Albert Gromaire	Ralph Burton Newbre
James Alfred Biggs	George Winfield Haley	Kinsuke Otsubo
Albert A. Brown	Louis Bolton Laughlin	Leland Ray Packwood
Ivan Claude Burke	Gordon Felix Lyon	George Thomas Poole
Louis Edward Clay	James Ernest McGregor	Harry George Ryan
Eugene Clair Clendenin	John H. McKay	Otto Albert Schoenwald
Ernest Downes	Charles Herbert Marriott	Anson Burlingame Smith, Jr.
John James Driscoll	William Andrew Menne	Clyde Wallace Usher
G. Lawrence Fleisig	William Junius Mhoon	Heinrich Wortmann

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.

THE annual commencement exercises of the University of Maryland, Dental Department, were held in Baltimore, Md., May 31, 1907.

Addresses were delivered by Francis Landey Patton and G. Stanley Hall.

The degree of Doctor of Dental Surgery was conferred by the Hon. Edwin Warfield, LL.D., on the following graduates:

Robert Orman Apple	North Carolina	Paul Lynch	Massachusetts
Troy A. Apple	North Carolina	William A. Lyons	West Virginia
Luther P. Baker	North Carolina	Samuel Horace McCall	North Carolina
A. Mack Berryhill	North Carolina	Herbert L. Mann	North Carolina
Arthur J. Bowker	New Jersey	Franklin J. Markert	Florida
Hugh J. Burton	Maryland	Robert H. Mills	Florida
Francis Derr Carlton	North Carolina	Coleman Joseph O'Shanecy	New York
Abraham Cramer	Maryland	William Henry Perrin	South Carolina
William Diedrich Creet	New York	Arthur P. Reade	North Carolina
Miles M. Culliney	Connecticut	Lawrence J. Robertson	Maryland
William Moylan Degnan	Connecticut	Solomon Rosengardt	Russia
Samuel E. Douglass	North Carolina	Albert C. Roy	New York
Linus M. Edwards	North Carolina	A. Preston Scarborough	Pennsylvania
Travis Fletcher Epes	Virginia	Abraham Samuel Shpritz	Maryland
Singleton C. Ford	North Carolina	Richard F. Simmons	Virginia
Harrison A. Freeman	Maryland	Herbert C. Smathers	North Carolina
Winfield S. Garland	New Hampshire	Wilbert B. Smith	Nova Scotia
Edward Garzouzi	Egypt	Thomas W. Smithson	North Carolina
Arsenius Georgion	Turkey	Ralph Thomas Somers	Virginia
Edward Greene	North Carolina	Robert L. Speas	North Carolina
James William Harrower	Virginia	Sadayoshi Teraki	Japan
Julius E. Heronemus	Maryland	Louis A. H. Theil	Wisconsin
John F. Kernodle	North Carolina	Harry L. Thompson	New York
E. Gordon Lee	North Carolina	George Edward Truitt	Maryland
William Judson Lewis	New York	George Christopher Weighart	New York
Walter S. Lightner	Pennsylvania		

PHILADELPHIA DENTAL COLLEGE.

THE forty-fourth annual commencement exercises of the Philadelphia Dental College were held in the Academy of Music, Philadelphia, Pa., June 1, 1907.

An address was delivered by the Hon. Wm. N. Ashman, LL.D., and the valedictorian was Chas. Earle Lee.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Fred Leslie Agnew	Pennsylvania	Andrew W. Edstrom	Pennsylvania
Oscar S. Ayars	New Jersey	Frederick Philip Ermann	New York
C. Irving Baldwin	New York	Franklin S. Fluck	Pennsylvania
George Francis Barlow	New York	DeLorme Trow Fordyce	Canada
Ralph M. Bennett	Connecticut	David W. Gaylord	Connecticut
Joseph Williams Borchardt	Connecticut	George Embree Glean	West Indies
Clarence G. Brooks	Connecticut	Oscar Daniel Glick	Pennsylvania
Daniel Stanhope Caldwell	North Carolina	Arthur Milton Green	New York
Walter M. Caples	Australia	Frank Morton Green	New York
Stephen Joseph Casey	Massachusetts	Sancho Eugene Guernard	Porto Rico
Matthias Henry Casey	Massachusetts	Andrew Joseph Hefferman	Pennsylvania
Samuel Castillo	Honduras	William R. Heilig	Pennsylvania
Wm. Daniel Chamberlain	New York	John A. Higgins	Massachusetts
Gordon Bennett Chase	New York	Graham Finley Hirzel	Pennsylvania
Charles Courtlandt Child	New Jersey	George S. Hixon	Pennsylvania
William Ridge Cornell	New Jersey	Arthur Beecher Holmes	Connecticut
Thomas A. Crawley	Massachusetts	Frederick Hoppman	Pennsylvania
Benoni C. DuPlaine	Pennsylvania	Albert J. Houlihan	Pennsylvania

Arthur Louis Jean.....	Massachusetts	Edson J. Pritchard	New York
Clayton Sydney Johnson ...	Pennsylvania	Ona Rittenhouse	New Jersey
Douglas Campbell Kahn	New York	Angus V. Rose	New York
John F. Ladley Keane	New Jersey	Herbert Leon Scammon ...	Maine
John Benedict Keller	New Jersey	C. J. Waldman Shenker....	Pennsylvania
George Henry Kueen	Connecticut	Edward Smith	New York
Leo M. Kreielsheimer	New York	William Vincent Stearne...	Pennsylvania
Carlos Simeon Lardizabal..	Honduras	Harry Stein	New Jersey
Josephine Clair Lawton ...	Connecticut	Charles Wm. Sutherland ..	Canada
Charles Earle Lee	New York	John Andrew Teeden	Rhode Island
Frank Eastman Long	Indiana	Frederick Primrose Temple	Nova Scotia
John Lord	Pennsylvania	Percy Charles Thomas ...	British Columbia
Arthur R. Mackenzie	Canada	Herbert Edward Thomas...	British Columbia
William Harget Magann ..	Pennsylvania	Joseph DeWitt Torrey ...	New York
Leo A. Menaker	New York	Aurel Tschebull	Austria
Harry A. Metzler	Pennsylvania	Clifford Woodruff Vivan ...	Connecticut
Lorenzo H. Moran	Canada	George William Wadlinger.	Pennsylvania
Adam W. Mullen	Maryland	Maximilian M. Weintraub..	Pennsylvania
Hugh Aloysius McMenamin	Pennsylvania	David L. L. White	Massachusetts
William John O'Malley	Massachusetts	Robert James Williams...	Connecticut
Arthur P. O'Neill	Massachusetts	G. Washington Wittmaier..	Pennsylvania
Harry Parvey	New York	William Samuel Wittstein.	Connecticut
Charles Albert Pike	Maine	John Evans Wright	Canada
Freeman T. Powers	Pennsylvania	George J. D. Wurfflein ...	Pennsylvania
Wesley Herbert Pritchard..	New York	George Edward Yieter ...	Pennsylvania

GEORGETOWN UNIVERSITY, DENTAL DEPARTMENT.

THE fifty-eighth annual commencement exercises of the Georgetown University, Dental Department, were held Tuesday, June 11, 1907, in Washington, D. C.

The valedictorian was Harry Robert Hermes, M.D., and an address to the graduates was delivered by Edwin B. Behrend, A.B., M.D.

The degree of Doctor of Dental Surgery was conferred by Rev. David Hillhouse Buel, S.J., on the following graduates:

Frank L. Curry	Massachusetts	Harry B. Riley	Washington, D. C.
Albert L. F. Joliat	Ohio	Matthew J. Sweeney	Massachusetts
Richard J. Murnighan	New York	Eiichi Sakurai	Japan
Daniel A. Murphy	Massachusetts		

TUFTS COLLEGE DENTAL SCHOOL.

THE fifty-first annual commencement exercises of Tufts College Dental School were held in Boston, Mass., June 19, 1907.

The degree of Doctor of Dental Medicine was conferred on the following graduates:

Mary Evangeline Gaffney	Howard Arthur Lampher	Louis James Palmer
Raymond Eugene Gates	John LeRoy Lougee	Solon Wilder Peters
Arial Wellington George	Daniel Lawrence Lynch	William Porter Pratt
James Henry Gettings	Ronald John MacDonald	Carl Eugene Richardson
Elias Goldberg	Frederick Joseph McIntire	Carroll Henry Ricker
Austin Ellsworth Greenwood	Lewis Steele McQuade	Timothy Francis Rock
David Edward Hanlon	Benjamin Butler Marr	Benjamin Franklin Roseman
Leonard Garland Herne	Myron Whitmore Marr	John Robert Ross
Aaron Locke Higgins	John Foley Martin	Earle Dewey Sawyer
George Vincent Higgins	Edmund Francis Moran	Ardenne Albert Stott
Alice Josephine Biggs Hopkins	Charles Russell Morgan	Edward Vincent Sullivan
George Lewis Howland	Paul Nettle	Annie Elzina Taft
Alice Elizabeth Kelly	Carl Robert O'Brien	Eleanor Marie Tighe
Joseph Henry Kerrigan	Frank Anthony Pagliuca	

UNIVERSITY OF MICHIGAN, COLLEGE OF DENTAL SURGERY.

THE sixty-third annual commencement exercises of the University of Michigan, College of Dental Surgery, were held at Ann Arbor, Mich., June 20, 1907.

The commencement oration was delivered by Ira Remsen, LL.D., president of Johns Hopkins University.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Joseph Warren Anson
Irwin Charles Ashley
Fritz Albert Beyer
Charles Lee Bliss
Grace Winter Callahan
Peter Alban Chesterfield
Le Grand Clapper
William Alfred Cook
Herbert Melville Dixon
James Samuel Donaldson
Le Van Rolland Drake
Isadore Albert Eppstein
Robert George Fralick
Murlin Luke Gardner
Ralph Gordon Gix

Fred Schorno Granger
Roy Wallace Heath
Guy Truxell Katner
Carl Leslie Keyes
Herman Harry Landes
James Henry Linsley
Harry Egbert Loeffler
Lewis Kempton Mobley
Farland Tenny Morse
Lewis David Mount
Mason Terpening Mount
William John Neelands
Michael Joseph O'Neil
Harvey Carlyle Pollock
Max Raabe

Carl Gustav Riep
Michael C. Ruen
Claude Bergan Smith
George Herbert Smith
John Caven Smith
Alva J. Stamp
Clyde Elmo Swain
Mark Edward Thompson
Arend Vyn
Ernst Wagner
Harry Turner Wallace
Griffy Golding Ward
Louis Roscoe Weinig
Willis Walton Whipple
William Everet Wilson

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

THE forty-ninth annual commencement exercises of the Northwestern University Dental School were held in Chicago, Ill., June 20, 1907.

An address was delivered by the Hon. Chas. Warren Fairbanks, Vice-president of the United States.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Homer Ernest Agar
Arthur Cornelius Agern
Delbert Arthur Akin
Lafe Carl Allender
Carleton N. Barrett
Edward John Bast
Armin Peter Baur
Charles Edgar Bell
Arthur Gustave Bergman
A. Bernard Bloom
Richard Mark Bolton
David James Brass
Arthur Malcolm Bressler
Cline Brockman
Evan Alma Brown
George Edward Burket
Arthur Dennis Bushnell
William Preston Carroll
John Maynard Casler
Moses Anthony Cassill
Gordon Chappuie
Lewis Knapp Concklin
Willard Thomas Conley
Orra Ivan Cook

Oliver J. Courtice
Nick Williams Cox
Edward R. Danforth
Don Delbert Drake
Dorsey D. Fisher
John Elder Forsyth
Ota F. Foster
James D. Frankel
Morris Grossman
George Roy Heap
Albert C. Hess
Alvin Fabian Johnson
James Edward Johnson
Orlando V. D. Jones
Boyd Longwell Kelley
William Small Kennedy
Charles Henry Kerr
John August Keyes
Dixon Baker Keyser
George G. Kimball
Herbert P. Kindt
August C. Koenig
Guy Arthur Landee

Harry Edward Lawver
Arthur Brush Lee
Alvin Barton Linne
J. Harding Long
Ralph Elliott Longwell
Daniel W. McKenna
Arthur Charles McLaren
Peter Mahony
William Charles Mason
Thomas P. Merchant
Frank Metcalfe
Theodore Miller
Harry Chandler Mitchell
Charles Louis Mitten
Cyrus A. Myers
Andrew Watson Myles
Luke Leo Norris
Richard Evan Owens
Arthur Wescott Pailthorp
Royal Edgar Pfouts
William Bernard Power
Christian Albert Rasch
Ora Ray Rice

HARVARD DENTAL SCHOOL.

THE annual commencement exercises of the Harvard Dental School were held in Sanders' Theater, Cambridge, Mass., June 26, 1907.

The degree of Doctor of Dental Medicine was conferred upon the following graduates:

Lawrence George Atherton	Irvin Whitley Kew	Richard John Owen
John Albert Breen	Howard Arthur Lane	Albert Pfeiffer
Charles Julius Edmond Challis	Alvin Benton Leavitt	Hugo Charles Rietz
Moses Alexander Chertok	José P. F. P. Martinho Lobo	Reinhold Ruelberg
Nathaniel Abraham Finkelstein	Charles McLellan McKenzie	John Campbell Thompson
Samuel Carson Huggins	George Nicholson McPherson	John Edwin Tibbetts
Edwin Stearns Kent	Herman Dutton Marggaff	Leo Augustus White

WESTERN RESERVE UNIVERSITY, DENTAL SCHOOL.

THE fourteenth annual commencement exercises of the Dental School, Western Reserve University, were held in the Beckwith Church, Cleveland, Ohio, Thursday, June 13, 1907.

An address was delivered by Francis Greenwood Peabody.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Frank Lee Anway	Bruce Raymer Gilbreath	Charles Rudolph Pheneger
Thomas Edward Armstrong	Grover Cleveland Gotshall	Charles Chamberlain Rogers
Raleigh Pringle Barnes	Ernest Meade Herrick	George Harlow Smith
Frank Dennis	Lawrence Alfred Krejci	Harry Delmont Smith
Herman Edward Eddy	Edmonde Joseph LaBarge	Horace Van Valkenburg
Harry Baker Fought	Louis Lyman	Will Wallace Wright
Maurice Berton Calvin	Walter Howard Maxwell	

UNIVERSITY OF MINNESOTA, COLLEGE OF DENTISTRY.

THE thirty-fifth annual commencement exercises of the University of Minnesota, College of Dentistry, were held in the Armory, Minneapolis, Minn., June 13, 1907.

An address was delivered by the Hon. Wm. H. Taft, Secretary of War.

The degree of Doctor of Dental Surgery was conferred by President Cyrus Northrop, LL.D., on the following graduates:

Walter Stene Aarnes	Minnesota	Rolland Ralph Jones	Minnesota
Owen K. Alrick	Minnesota	Clyde Luther May	Minnesota
Robert Andrew Barnitz	Minnesota	William T. Niemi	Wisconsin
Theodore H. Bauer	Minnesota	Wright Benton Page	Minnesota
Ansel M. Birnberg	Minnesota	Egbert Ralph Pinney	Minnesota
George H. Borgwardt	Iowa	Cleveland A. Purdon	North Dakota
Archibald B. Butter	Illinois	Henry George Ramstead	Wisconsin
Allen C. Carlaw	Minnesota	Chas. Rauch	Minnesota
George Myron Damon	Minnesota	Peter Oscar Rosendahl	Minnesota
Owen Eugene Doely	Minnesota	Oscar Christian Seebach	Minnesota
Francis Gerald Fitz Gerald	Minnesota	Nat Cyrus Smith	Minnesota
Knut Arthur Glimme	Minnesota	Thomas Heathcote Thomas	Iowa
Charles Arthur Griffith	Minnesota	Homer Abraham Weaver	Minnesota
Orlen C. Heieie	Minnesota	Arthur A. Zierold	Minnesota
Edward John Hollern	Minnesota		

UNIVERSITY OF CALIFORNIA, DENTAL DEPARTMENT.

At the annual commencement exercises of the University of California, Dental Department, held in Berkeley, Cal., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Herbert S. Bibbero
Don W. Byrne
Leland E. Carter
Henry T. Daley
Seeley T. Donohoe

Nicholas S. Duggan
Henry M. Elberg
Jeremiah D. Fogarty
Bert J. Hoffman
Leonard L. Martin

Frederic W. Meyer
Henley E. Miller
Durrell H. Murchie
Fulton Patterson

Charles J. Sexton
Arthur R. Sontheimer
Leslie A. Stern
J. Lloyd Talbott

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

August and September, 1907.

AUGUST.

FIRST FRENCH CONGRESS OF STOMATOLOGY.
Paris. Five days: August 1st to 5th.

INTERNATIONAL DENTAL FEDERATION. Amsterdam. Two days: August 8th and 9th.

NATIONAL ASSOCIATION OF PHYSICIANS,
PHARMACISTS, AND DENTISTS. Baltimore.
Three days: August 27th to 29th.

SEPTEMBER.

JAMESTOWN DENTAL CONVENTION. Norfolk, Va. Three days: September 10th to 12th.

NORTHERN IOWA DENTAL SOCIETY. Sioux City. Three days: September 4th to 6th.

VIRGINIA STATE DENTAL ASSOCIATION. Norfolk. September 9th.

MISSISSIPPI DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Mississippi Dental Association, held in Meridian, Miss., May 28, 29, and 30, 1907, proved to be the best in the history of the association. A great many young men were received as members, and the membership is double what it was three years ago.

The social feature was a banquet tendered the association by the Meridian Dental So-

ciety, and was presided over by Dr. C. J. Washington of Memphis, Tenn., as toastmaster, and many well chosen toasts were responded to by the members present.

The following officers were elected: Dr. L. A. Smith, Port Gibson, president; Dr. J. F. Brunson, Meridian, first vice-president; Dr. C. F. Roger, Natchez, second vice-president; Dr. E. Douglas Hood, Tupelo, secretary; Dr. L. B. Price, Corinth, corresponding secretary; Dr. C. C. Crowder, Kosciusko, treasurer. The association will meet in Jackson next year.

E. DOUGLAS HOOD, *Sec'y*,
Tupelo, Miss.

FIRST FRENCH CONGRESS OF STOMATOLOGY.

A CONGRESS of stomatology, styled the First French Congress of Stomatology, will take place in Paris from August 1 to 5, 1907.

The Committee of Organization is as follows: Drs. Galippe and Redier, honorary presidents; Dr. Cruet, president; Drs. Claude Martin of Lyons, and J. Ferrier, vice-presidents; Dr. Chompret, general secretary; Dr. Giree, treasurer.

The Congress will be open to all French and foreign doctors of medicine who are interested in dental and oral science. Address

DR. CHOMPRET, *General Sec'y*,
182 rue de Rivoli, Paris.

NATIONAL ASSOCIATION OF PHYSICIANS, PHARMA- CISTS, AND DENTISTS.

THE annual meeting of the National Association of Physicians, Pharmacists, and Dentists will be held in Metropolitan Hall, Baltimore, Md., for three days, beginning August 27, 1907.

Dr. WM. S. LOFTON, *Sec'y Dental Section*,
1523 "M" st., N.W., Washington, D. C.

NOTICE FROM N. D. A. COMMITTEE ON THE HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view dis-

closed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 500, leaving 200 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUEMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. McMANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.
CHAS. McMANUS, *Th'man*, Hartford, Conn.

"F. D. I."

INTERNATIONAL DENTAL FEDERATION.

THE next meeting of the *Fédération Dentaire Internationale*, to be held at Amsterdam on August 8 and 9, 1907, promises to be one of exceptional interest, as a number of questions of great importance to the federation, as well as to the whole profession, must receive thorough consideration at that time.

Our experience has brought out a number of points in the rules and regulations which require to be cleared up. The question of a pamphlet containing specific directions for the care of the teeth, presented in a form adapted to widest circulation among the poor, is also to receive its final settlement at Amsterdam.

Particular attention will be devoted to a matter which after a period of comparative quiet is again agitating the minds of dental teachers and practitioners, and which concerns the education which in future should be demanded of the dentist. The question whether the dentist should above all things be a full graduate in medicine, with a knowledge, more or less complete, of dentistry superadded, or should begin somewhat earlier to so shape his course as to best enable him to meet the demands which his profession and his patients make on him, is one which the F. D. I. has already pronounced upon in its session at Stockholm in August 1902. It cannot, however, be considered as having been definitely disposed of. It is, on the contrary, perhaps more acute at present than at any previous period in the history of our professional development.

The position of the F. D. I. having become more firmly established and its vote more authoritative, it is very desirable that its opinion should again be heard on this most important question, and every member should come prepared to give definite expression to his views.

Another point to be dealt with relates to the action of the committee of organization of the next international medical congress to be held in Budapest in 1909, in excluding from participation dentists who do not possess the medical degree. A consideration of the rights and duties of the F. D. I. in connection with the international dental congress

to be held in Berlin in the same year will also take up some of the time.

These are a few of the matters which require special attention, and I sincerely hope that members will make every possible effort to be present. The steps taken toward the founding of an intellectual world-center at the Hague, if realized—and there seems to be every reason for trusting that such will be the case—will give an impulse to internationalism which will add greatly to the significance and importance of the F. D. I., and the hopes that it will be able to accomplish much in the interest of our profession and of humanity at large seem nearer fulfillment now than ever before.

W. D. MILLER, *President*.

NATIONAL DENTAL ASSOCIATION.

THE eleventh annual meeting of the National Dental Association will be held in Minneapolis, Minnesota, July 30 to August 2, 1907. In many ways this promises to be the most interesting and important meeting in the history of the association, and as it has been some years since a meeting of the National was held in this section of the country, it is confidently expected that the attendance will surpass that of any previous one.

The general sessions of the association will be held in the First Baptist Church, corner Tenth st. and Harmon Place, and it is proposed by the Program Committee, in consequence of a prevailing sentiment, that all papers be read so that the entire membership may have an opportunity to hear and discuss them. Only one section therefore will be in session at the same time.

There will be sufficient time allowed in carrying out the program so that each section will have two sessions of at least three hours' duration, which should be ample.

Membership in the association is open only to delegates from state societies, yet a most cordial invitation is extended to all reputable practitioners to attend the meeting.

Reduced rates on all railways, except in Minnesota, on the certificate plan, of a round trip for a fare and a third, have been secured, full details of which will appear in the official announcement.

Hotel Plaza has been designated as headquarters for the association, while the Clinica

and Dental Exhibit will be held at the First National Guard Armory on Sixteenth st. Hotels and rates are as follows: The Plaza, \$2.00 per day and upward; European plan. The West, \$1.00 per day and upward; European plan. The Nicolett, \$1.00 per day and upward; European plan. The Majestic, \$1.00 per day and upward; European plan. For hotel reservations, etc., address the chairman of the local committee of arrangements, F. B. KREMER, Masonic Temple, Minneapolis.

Minneapolis and vicinity is one of the most interesting and beautiful sections of our country, and particularly so at this season of the year; and in addition to this, our local committee of arrangements is planning many features of interest for the entertainment and convenience of all. It is the earnest wish and expectation of the officers of the association that there shall be a large attendance at the meeting.

Organization.

SECTION I:

Prosthetic Dentistry, Crown and Bridge Work, Orthodontia, Metallurgy, Chemistry, and Allied Subjects.

D. O. M. LE CRON (chairman), Missouri Trust bldg., St. Louis, Mo.

W. G. MASON (vice-chairman), Tampa, Fla.

E. P. DAMERON (secretary), 58 De Menil bldg., St. Louis, Mo.

SECTION II:

Operative Dentistry, Nomenclature, Literature, Dental Education, and Allied Subjects.

WM. CRENSHAW (chairman), 621 Prudential bldg., Atlanta, Ga.

JOHN I. HART (vice-chairman), 118 W. Fifty-sixth st., New York city.

J. J. SARRAZIN (secretary), Godchaux bldg., New Orleans, La.

SECTION III:

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Hygiene, Prophylaxis, Materia Medica, and Allied Subjects.

WM. CARR (chairman), 35 W. Forty-sixth st., New York city.

W. H. G. LOGAN (vice-chairman), 785 Winthrop ave., Chicago, Ill.

M. L. RHEIN (secretary), 38 E. Sixty-first st., New York city.

CLINICS.

E. K. WEDELSTAEDT (chairman), 204 New York Life bldg., St. Paul, Minn.

SECTION ON INLAYS.

WALTER N. MURRAY (chairman), 601 Medical blk., Minneapolis, Minn.

LOCAL COMMITTEE OF ARRANGEMENTS.

F. B. KREMER (chairman), Masonic Temple, Minneapolis, Minn.

Delegates received only from state societies, but a cordial invitation is extended to all reputable practitioners to attend the meeting.

C. S. BUTLER, *Sec'y*,
267 Elmwood ave., Buffalo, N. Y.

A. H. PECK, *President*,
92 State st., Chicago, Ill.

Section I.

PARTIAL PROGRAM.

The following papers have been secured so far:

"The Over-Arch-Bar in Bridge Work." By L. C. Bryan, Basel, Switzerland.

"Some Practical Experiences Theoretically Expressed." By Emory A. Bryant, Washington, D. C.

"Treatment of Malocclusions of the Deciduous Teeth." By Guilhermena P. Mendell, Minneapolis, Minn.

"Evolution." By Chas. L. Hungerford, Kansas City, Mo.

"The Effect of Excess of Mercury upon Shrinkage, Expansion, Edge Strength, Flow, Change in Composition, and Stability of the Dental Amalgam Alloys." By Marcus L. Ward, Detroit, Mich.

"Porcelain—the Cavity and the Matrix." By C. M. Work, Ottumwa, Iowa.

"Physical Condition of or Pertaining to the Human Teeth." By F. G. Corey, Council Grove, Kans.

"Method of Replacing Broken Facings on Crowns and Bridges." By J. V. Conzett, Dubuque, Iowa.

There will be a few additions to the list, as returns are not yet in.

D. O. M. LECRON, *Ch'man*,
E. P. DAMERON, *Sec'y*.

Section II.

PARTIAL PROGRAM.

"An Original Method of Casting Gold Inlays." [Illustrated with India ink drawings and models showing technique.] By Carroll H. Frink, Fernandina, Fla.

"Modern Methods of Combining Cohesive Gold with Non-cohesive Gold, with Tin, and with Tin-Gold." By L. G. Noel, Nashville, Tenn.

"Physical Characteristics and Surgery of Pyorrhea." By Thomas B. Hartzell, Minneapolis, Minn.

"The Functions of the State Dental Society." By G. O. Orr, Jordan, Minn.

"Dental Literature." By Charles McManus, Hartford, Conn.

WM. CRENSHAW, *Ch'man*,
J. J. SARRAZIN, *Sec'y*.

Section III.

"Buccal Manifestations of Syphilis." By Victor C. Pederson, New York city.

"The Prevention of Disease of the Mouth and Teeth by Proper Oral Prophylaxis in the Young." By Herbert L. Wheeler, New York city.

"Anatomy of the Palate—Normal and Cleft." By Truman W. Brophy, Chicago, Ill.

"Prophylaxis, with Special Reference to the Wisdom Teeth." By Joseph Head, Philadelphia, Pa.

"Dental and Oral Lesions of Leprosy." By Robert T. Oliver, U. S. A. Dental Corps.

"Mouth-infection the Cause of Systemic Disease." By Arthur H. Merritt, New York.

WM. CARR, *Ch'man*,
M. L. RHEIN, *Sec'y*.

Clinic Section.

DISTRICT AND STATE CHAIRMEN.

New England States. Dr. G. E. Savage, Worcester, Mass.

New York. Dr. F. L. Fossum, N. Y.

New Jersey, Delaware, and District of Columbia. Dr. M. F. Finley, Washington, D. C.

Maryland. Dr. C. M. Gingrich, Baltimore, Md.

Virginia and West Virginia. Dr. F. W. Stiff, Richmond, Va.

North and South Carolina and Georgia. Dr. H. H. Johnson, Macon, Ga.

Florida, Alabama, and Mississippi. Dr. A. T. Reeves, Selma, Ala.

Tennessee and Kentucky. Dr. W. M. Slack, Memphis, Tenn.

Pennsylvania. Dr. H. E. Friesell, Pittsburg.

Ohio. Dr. H. C. Brown, Columbus.

Indiana. Dr. C. D. Lucas, Indianapolis.

Illinois. Dr. F. W. Gethro, Chicago.

Wisconsin. Dr. S. H. Chase, Madison.

Ontario.

Manitoba. Dr. K. C. Campbell, Winnipeg.

I regret to say that I have heard from very few of the state chairmen, therefore it is not possible to give the program in detail.

The headquarters in Minneapolis will be the Plaza Hotel. The clinics will be held in the Armory, one-half block from the hotel.

The clinic will be the largest the National has ever held. There will be sixty-five practical operations on Wednesday July 31st, and the same number of operations on Thursday August 1st. About forty of these one hundred and thirty operations will be the making and placing of inlays. The remainder of the operations will be divided into gold, amalgam, tin, cement, and gold-and-tin fillings, the removal of calculus, the administration of local anesthetics, etc. There is every evidence at hand that there will be the usual large number of men holding table clinics. Until the various chairmen make their reports I am unable to complete the program. On Thursday, June 20th, the program will go to the printer. It will be impossible thereafter to place names upon it.

Dr. W. N. Murray of Minneapolis will have charge of the inlay section. Dr. F. S. Yeager of St. Paul will have charge of the table clinics. Dr. W. A. Grey of St. Paul will have charge of the surgical clinics, of which there will be a number. All of these men will appoint their own corps of assistants.

Drs. Carlson, Cox, Wells, Wilson, and myself will be in the clinic room, and we shall do everything possible to assist the operators.

After considerable persuasion, Dr. J. B. Ridout of St. Paul has agreed to give a blow-pipe demonstration. It is well worth making a trip from New York to Minneapolis to wit-

ness this clinic. I am able to unhesitatingly indorse the demonstration which Dr. Ridout will give, for I feel that it will be one of the most interesting and attractive of all the table clinics.

Dr. Bryan and Dr. Müller of Switzerland are journeying to the meeting with some things in the mechanical line which they feel are of the greatest value for everybody to see.

These are simply special features.

I said there would be one hundred and thirty practical demonstrations in Minneapolis on the two days of the clinic. I speak in this way for the reason that the men belonging to the metal filling clubs in the Northwest have requested to be allowed to fill any and all vacancies which might occur. This action on their part is not only most laudable, but it at once assures those who will attend the meeting of witnessing the largest operative clinic ever arranged for the consideration of the members of the N. D. A.

I return sincere thanks to all who have been willing to work and who have assisted Dr. Clack and myself to arrange the best clinic possible.

I also wish to return many thanks to the editors of the different dental journals for their assistance and co-operation.

My program at present contains the names of the following gentlemen who will make operations:

PARTIAL PROGRAM.

Surgical Clinic.

W. H. C. Logan, Chicago, Ill.
L. F. Luckie, Birmingham, Ala.
W. H. DeFord, Des Moines, Ia.

Inlay Section.

R. H. Volland, Iowa City, Iowa.
C. H. Farrand, LaCrosse, Wis.
F. H. Brimrose, Butte, Montana.
C. M. Work, Ottumwa, Iowa.
W. H. Cudworth, Milwaukee, Wis.
J. E. Meyers, Minneapolis, Minn.
W. C. Pike, Minneapolis, Minn.
T. W. Russell, Minneapolis, Minn.
A. E. Peck, Minneapolis, Minn.
F. B. Kremer, Minneapolis, Minn.
J. O. Wells, Minneapolis, Minn.
W. N. Murray, Minneapolis, Minn.
W. J. Brownlee, Devil's Lake, N. D.
J. Q. Byram, Indianapolis, Ind.
L. C. Elkins, St. Augustine, Fla.

C. A. Sevier, Jackson, Tenn.
A. G. Fee, Superior, Wis.
R. R. Fisk, Spokane, Wash.
G. W. Schwartz, Chicago, Ill.
J. D. Park, Duluth, Minn.
A. A. Jennings, Milwaukee, Wis.
G. J. Pattison, Fargo, N. D.
P. B. McCullough, Philadelphia, Pa.
C. G. Von Suessemilch, Duluth, Minn.
A. T. Reeves, Selma, Ala.
C. H. Seeger, Manitowoc, Wis.

Other Operations.

H. J. Beemer, Newton, N. J.
J. J. Booth, Marion, Iowa.
E. S. Brown, Edina, Mo.
F. Bernard, Kennett Square, Pa.
J. V. Conzett, Dubuque, Iowa.
W. G. Crandall, Spencer, Iowa.
Wm. Finn, Cedar Rapids, Iowa.
J. W. S. Gallagher, Winona, Minn.
C. L. Gunn, Gadsden, Ala.
T. B. Hartzell, Minneapolis, Minn.
T. A. Hardgrove, Fondulac, Wis.
F. S. James, Winona, Minn.
W. O. Lovett, Brewton, Ala.
C. B. Miller, Cedar Falls, Iowa.
W. H. K. Moyer, Little Falls, Minn.
S. G. McCallin, Chicago, Ill.
C. H. Oakman, Detroit, Mich.
J. B. Pherrin, Central City, Iowa.
F. S. Robinson, Chippewa Falls, Wis.
F. G. Richardson, Mason City, Iowa.
G. W. Slingluff, Burlington, Iowa.
Alice M. Steeves, Boston, Mass.
J. F. Wallace, Canton, Mo.
P. H. Wright, Oxford, Miss.
O. C. Zieger, Owatonna, Minn.
G. N. Beemer, Mason City, Iowa.
C. N. Booth, Cedar Rapids, Iowa.
A. D. Black, Chicago, Ill.
T. F. Cooke, Burlington, Iowa.
W. R. Clack, Clear Lake, Iowa.
A. C. Fawcett, Rochester, Minn.
C. J. Grove, St. Paul, Minn.
L. Greenbaum, Philadelphia, Pa.
G. S. Handy, Natchez, Miss.
P. H. Jones, Clear Lake, Iowa.
W. B. James, Tracy, Minn.
A. M. Lewis, Austin, Minn.
H. R. Mavis, Minneapolis, Minn.
G. D. Moyer, Montevideo, Minn.
F. N. Owens, St. Paul, Minn.
A. R. Owre, Minneapolis, Minn.

W. S. Pugh, Mobile, Ala.
 W. J. Reynolds, Selma, Ala.
 C. H. Robinson, Wabasha, Minn.
 A. C. Searl, Owatonna, Minn.
 F. G. Van Stratum, Hurley, Wis.
 C. E. Woodbury, Council Bluffs, Iowa.
 F. J. Yerkes, Owatonna, Minn.

Table Clinics.

J. E. Argue, Red Lake Falls, Minn.
 A. P. Burkhart, Buffalo, N. Y.
 H. L. Cruttenden, Northfield, Minn.
 J. C. Corcoran, St. Paul, Minn.
 I. N. Carr, Durham, N. C.
 C. H. Frink, Fernandina, Fla.
 W. L. Fickes, Pittsburg, Pa.
 G. F. Hauser, LaCrosse, Wis.
 F. R. Houston, Green Bay, Wis.
 C. W. Jones, St. Paul, Minn.
 C. H. Land, Detroit, Mich.
 Eugene Müller, Zurich, Switzerland.
 G. C. Marlow, Lancaster, Wis.
 F. A. Peeso, Philadelphia, Pa.
 J. W. Ritter, Charleston, Ill.
 E. F. Summery, Eau Claire, Wis.
 S. S. Stowfield, Pittsfield, Mass.
 E. F. Tinker, Wheatland, Iowa.
 O. A. Weiss, Minneapolis, Minn.
 L. C. Bryan, Basel, Switzerland.
 G. A. Bowers, Nassau, N. H.
 W. S. Curtis, Montpelier, Vt.
 J. P. Carlisle, Greenville, S. C.
 F. E. Dodson, Grand Rapids, Mich.
 W. N. Fine, Philadelphia, Pa.
 E. A. Honey, Kalamazoo, Mich.
 J. A. Hall, Collinsville, Ala.
 G. F. Jernigan, New York, N. Y.
 J. L. Kelly, St. Paul, Minn.
 C. W. Lokey, Talladega, Ala.
 W. H. MacNeil, Minneapolis, Minn.
 C. P. Peterson, Mankato, Minn.
 J. B. Ridout, St. Paul, Minn.
 C. F. Rodolf, Muscoda, Wis.
 A. C. Steuerwald, St. Angars, Iowa.
 A. J. Sawyer, Manchester, N. H.
 M. L. Ward, Detroit, Mich.
 J. D. Wise, West Point, Miss.

This constitutes the clinic up to date. But three chairmen have reported from their states. There will be many more names to add to this program when the rest of the reports reach me.

E. K. WEDELSTAEDT, *Ch'man Clinic Section*,
 N. Y. Life bldg., St. Paul, Minn.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
 1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, 305 N. Grand ave.,
 St. Louis, Mo., *Chairman*.
 H. WOOD CAMPBELL, Suffolk, Va., *Secretary*.
 F. W. STIFF, 600 E. Grace st., Richmond,
 Va., *Treasurer*.
 R. H. WALKER, Norfolk, Va.
 THOS. P. HINMAN, Atlanta, Ga.
 J. E. CHACE, Ocala, Fla.
 CLARENCE J. GRIEVES, Baltimore, Md.

THE Jamestown Dental Convention will be held in a specially equipped building on the Exposition grounds which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits, and all of these will be held in it. The entrance is outside of the grounds, but access to the grounds may be obtained through it. The building is wired with both direct and alternating current, equipped with running water, is well lighted, and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce bldg., Norfolk, Va. To him exhibitors should apply at once for space—price per foot and a plan of the hall will be sent upon request.

The clinics at the convention are under the supervision and direct control of Dr. C. J. Grievess, Park and Madison aves., Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each state in the Union and near countries, viz, Canada, Mexico, Cuba, and Hawaii. From these come reports of

the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen are given with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace st., Richmond, Va., who reports memberships rapidly coming in.

The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. (See communication as to hotel accommodations printed below, with prices on next page.)

A cordial invitation is extended to all ethical dentists to become members and attend the convention.

The membership fee is five dollars, which will entitle members to receive a bound copy of the proceedings. A half-rate—\$2.50—is made to *bona fide* dental students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee for indorsement and acceptance will entitle them to the rights and privileges of the convention.

Dr. E. P. Beadles was elected by the Committee on Organization in February to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention.

Hotel Accommodations.

[Communication from the Virginia members of the Committee of Organization.]

NORFOLK, VA., June 24, 1907.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In view of the statements that have gone out in relation to the lack of accommodation and high hotel charges in the vicinity of the Jamestown Exposition, we, the Virginia members of the Organization Committee of the Jamestown Dental Convention, deem it wise to make a formal statement of the situation, that the members of the profession who contemplate attending the Convention at the

Jamestown Exposition, Norfolk, Va., September 10–12, 1907, may not be misled or deterred in their purpose:

While at this time the Exposition is not entirely completed, it presents a very attractive appearance and is well worth seeing, and by the date set for the convention it will not only be fully completed but will be at the very height of its perfection.

Aside from any attraction that is offered by the Exposition, the assembling in Hampton Roads of the fleets of the nations of the world is amply worth the trip to the Jamestown Exposition.

The Jamestown Exposition grounds are not located in any one city but are nearly equidistant from the tidewater cities of Norfolk, Portsmouth, Newport News, Hampton, and Old Point Comfort, and within thirty minutes' ride by rail or water of any one of them.

The hotels and cottages of the summer resorts of Buckroe Beach, Ocean View, Willoughby Beach, Cape Henry, and Virginia Beach will be utilized for the accommodation of visitors.

The suburbs of Norfolk, Portsmouth, and Newport News—such as West Norfolk, Port Norfolk, South Norfolk, Berkley, Riverside, River View, Edgewater, Lambert's Point, and Parke Place—have many comfortable homes that will be open to receive guests, and are all well connected with electric lines of street railway to points of departure for the Exposition grounds.

We append a list of some of the leading hotels and their rates per day. In order to secure these rates it will be necessary to make reservations not later than August 15th.

The Inside Inn, with a capacity of 3000 persons, will be the official headquarters of the convention. The following are the rates of the Inside Inn:

INSIDE INN.

European plan, without bath, two persons in a room, which includes breakfast, privileges of the inn, and admission to the grounds after the guest has registered at the hotel, \$2.50 per day for each person. If room is occupied by only one person, the rate is \$3.50 per day. American plan, without bath, two persons in a room, which includes breakfast, privileges of the inn, luncheon, and our \$1.00

evening *table d'hôte* dinner with wine, admission to the grounds after the guest has registered at the hotel, \$3.50 per day for each person. If room be occupied by only one person, the rate is \$4.50.

The rates for rooms fronting the sea, or the sea and pine grove: American plan, if room be occupied by only one person the rate will be \$6.00 per day. If room be occupied by two persons the rate is \$8.00 for the two. American plan, with bath and toilet, \$8.00 per day for one person in a room, if room is occupied by two persons the rate is \$10.00 for the two.

The following is a partial list of Norfolk and Portsmouth hotels:

NORFOLK.

Algonquin Hotel, Granby st. and College place, \$1.00 per day and up.

Atlantic Hotel, Main and Granby sts., \$1.00 per day and up.

Colonial Hotel, 202 Granby st., \$1.00 per day and up.

Hotel Fairfax, City Hall ave. and Randolph st., \$1.50 per day and up.

The Monticello, City Hall ave. and Granby st., \$1.50 per day and up.

Gladstone Hotel, Main and Nebraska sts., \$1.00 per day and up.

Haddington Hotel, Granby st. and City Hall ave., \$1.00 to \$3.00 per day.

Hotel Savoy, Granby st. and City Hall ave., \$1.00 to \$3.00 per day.

Carolina Hotel, Atlantic and Plume sts., \$1.00 per day and up.

St. Denis Hotel, Main st. and Roanoke ave., \$1.00 per day and up.

Terminal Hotel, Plume and Atlantic sts., \$1.00 per day and up.

Henry Seelinger, 39-41 City Hall ave.

Lynnhaven Hotel, Freemason and Granby sts., \$2.50 per day and up.

Union Hotel, 35 Brewer st., \$0.50 per day and up.

Stag Hotels.

The Lee Stag Hotel, 97 Bank st., \$1.00 per day and up.

McDonalds, Main st. and Commercial Place, \$1.00 per day and up.

Victoria, 359-361 Main st., \$1.50 per day and up.

Henry Seelinger, 39-41 City Hall ave.

PORTSMOUTH.

Hotel Monroe, Court and High sts., \$1.00 per day and up.

Hotel Fairfax, Crawford and High sts., \$1.00 per day and up.

Pearson Hotel, High and Water sts., \$1.25 per day and up.

In addition to the hotels named, there are hundreds of private boarding-houses and rooming-houses, at which visitors may secure accommodations at reasonable rates.

Yours very truly,

R. H. WALKER, Norfolk, Va.

F. W. STIFF, Richmond, Va.

H. W. CAMPBELL, Sec'y,
Organization Committee.

Program.

TUESDAY, September 10th.

9.30 A.M.

Meeting called to order by the chairman of the Committee of Organization, Dr. Burton Lee Thorpe.

Invocation—Rev. Dr. C. L. Bane, pastor Memorial M. E. Church, Norfolk, Va.

Address of welcome—Hon. Harry St. George Tucker, president of the Jamestown Exposition.

Address of welcome—Hon. Claude A. Swanson, Governor of Virginia.

Address of welcome in behalf of the profession of Virginia—Dr. Joseph W. Eggleston, Richmond, Va.

Address of welcome—Dr. W. G. Mason, Tampa, Fla., president Southern Branch, N. D. A.

Address of welcome in behalf of the profession of the South—Dr. J. Y. Crawford, Nashville, Tenn.

Response to addresses of welcome—Dr. J. D. Patterson, Kansas City, Mo.

Address by the president—Dr. V. E. Turner, Raleigh, N. C.

11 A.M.

Lantern lecture—Prof. W. D. Miller, Berlin, Germany: "Demonstration of Preparations Relating to the Wasting (so-called Erosion) of the Teeth."

Discussion opened by Drs. Wilbur F. Litch,

Philadelphia, Pa., and A. W. Harlan, New York city.

2.30 P.M.

Illustrated lecture—Dr. Chas. L. Alexander, Charlotte, N. C.: "Gold Inlays."

Discussion opened by Drs. W. H. Taggart, Chicago, Ill., and H. H. Johnson, Macon, Ga.

8 P.M.

Smoker at Inside Inn. Dr. B. Holly Smith, chairman, Baltimore, Md.

WEDNESDAY, September 11th.

9 A.M. to 1 P.M.

Clinics in Convention Hall. Dr. Clarence J. Grieves, chairman, Baltimore, Md.

2.30 P.M.

Illustrated paper—Dr. F. T. Van Woert, Brooklyn, N. Y.: "Is the Cemented Filling the Filling of the Future?"

Discussion opened by Drs. Wm. K. Slater, Knoxville, Tenn., and Jos. Head, Philadelphia, Pa.

8 P.M.

Convention to be entertained as guests of the profession of Virginia.

THURSDAY, September 12th.

9 A.M. to 1 P.M.

Clinics in Convention Hall.

2.30 P.M.

Illustrated lecture—Dr. R. Ottolengui, New York, N. Y.: "The Purposes and Accomplishments of Modern Orthodontia."

Discussion opened by Drs. G. Edmond Kells, New Orleans, La., and Henry W. Morgan, Nashville, Tenn.

Adjournment.

Officers.

The following officers have been elected by the Committee of Organization:

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-president—Dr. B. Holly Smith, Baltimore, Md.

Secretary-general—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

Chairman of General Clinic Committee—Clarence J. Grieves, Park and Madison aves., Baltimore, Md.

Chairman of General Membership Committee—F. W. Stiff, Richmond, Va.

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VOL. XLIX.—66

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Mexico. Ricardo Figueroa, 1 Calle de Santo Domingo 8, City of Mexico.

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The clinics and exhibits at the Jamestown Convention are to be its interesting features.

Manufactures Exhibit.

The Committee on Manufactures Exhibit—Dr. John Manning, Norfolk, Va.—will show the latest and best dental instruments, appliances, machinery, furniture, and materials.

Orthodontia Exhibit.

Dr. Harry E. Kelsey (chairman), Baltimore, Md. The Committee on Orthodontia exhibit expect to have displayed at the Jamestown Dental Convention the best and most complete collection obtainable in the country, of models and appliances illustrating the treatment of the various classes of orthodontia cases. The committee also hopes to have exhibited rare and valuable collections illustrative of the progress of the science of orthodontia from its beginning down to the present day, thus adding an historical feature to the display. The rare and valuable collection of models of the American Society of Orthodontists has already been secured, and several of the most prominent orthodontists of the country have promised to contribute. In addition to this, Dr. R. Ottolengui will read a paper before the general body on "The Purposes and Accomplishments of Modern Orthodontia," which will be a paper reviewing and comparing the best in all methods to date.

Surgical Clinic.

Dr. L. M. Cowardin (chairman), Richmond, Va. Dr. J. Y. Crawford, Nashville, Tenn. Dr. A. G. Friedrichs, New Orleans, La.

Under this head a number of important surgical operations of the mouth, face, and jaw will be performed. Among the well-known operators who have signified their intention to operate are—Drs. G. V. I. Brown, Milwaukee, Wis.; W. A. Bryan, Nashville, Tenn.; Wm. Perrin Nicolson, Atlanta, Ga.; B. Holly Smith, Baltimore, Md.; V. P. Blair, St. Louis, Mo.; Frederick B. Moorehead, Chicago, Ill.; Randolph Winslow, Baltimore, Md.

Committee on Comparative Odontology.

Dr. Wm. Bebb (chairman), Los Angeles, Cal. Dr. A. H. Thompson (sec'y), Topeka, Kansas.

In this exhibit there will be about two thousand specimens illustrating comparative odontology, together with a number of pathological specimens showing the effects of rickets, actinomycosis, etc., upon the teeth and the bones of the face. The latter are probably the most interesting feature of the collection.

There will be specimens dissected to show the attachment and the development, others displaying the skin, skull, and teeth of the various animals, together with a number of extracted teeth of mammals. The invertebrates, fishes, reptiles, and birds will be represented by their food-reducing organs. A number of human skulls will be displayed, together with a collection of pathological human teeth. The collecting, preparation, and mounting of the specimens of Dr. Wm. Bebb, all of which work has been done by the exhibitor, is a feature of the exhibit which will be of interest to many. The pathological specimens, which may possibly have some bearing upon human dental pathology, are the most interesting part of the collection to the average dental student, and in this respect the Bebb collection is unique in having a larger number of these than any other, so far as known. Those that Dr. Bebb collected himself are certainly more authentic than any which might be obtained from a commercial collector. This collection was ex-

hibited at the Portland Dental Congress and received the hearty praise of all those who saw it.

The U. S. Naval Dental Exhibit.

Dr. Richard Grady (chairman), Annapolis, Md.

The U. S. Naval Dental Exhibit will include many hundreds of charts of the teeth of young men from sixteen to twenty-four years of age from all parts of the country, showing at a glance, and far more impressively than printed words could ever do, teeth filled, crowned, treated, extracted, unerupted, irregular, etc.; also the size of cavity on individual surfaces of teeth; also kind of filling, or crown or bridge.

The character of the work, if gold, is designated with gold paint; if amalgam, with aluminum paint. Much valuable information is to be found in memoranda of anything of special importance, malformation and malposition of teeth and jaws, mechanical injuries to teeth and jaws, polypus of pulp, pyorrhea, erosions, stains, reflex pains, regulating appliances, painful and difficult eruption of third molars, etc. The records, showing where caries is localized, extend over a period of years, and it is hoped that some day this store of recorded dental knowledge will be tabulated, and the result of observation and study brought before the profession as scientific questions for consideration and interpretation. While the charts are simple official records of the peculiarities of the teeth and of the operations performed upon them, yet they have furnished reliable evidence in several cases of drowning, as the teeth maintained their features and peculiarities when other external signs were wanting in establishing personal identity. A summary of the relative frequency of dental caries after sixteen years of age (and before, in permanent teeth) with number of teeth present, fillings, crowns, and bridges will also be exhibited.

Committee on Dental History.

Dr. Wm. H. Trueman (chairman), Philadelphia, Pa. Dr. Chas. McManus (sec'y), Hartford, Conn.

This exhibit will show a collection of photographs, early certificates and diplomas, portraits of distinguished practitioners, collec-

tions of ancient dental instruments, and specimens of dental prosthetic skill, porcelain work, etc.; a photograph of title-pages of early American dental literature, books and journals, etc. The Committee on History will also prepare a report on the contribution of pioneer southern dentists, and of dental colleges and societies of the southern states. This will be published in the proceedings.

For further information address

H. W. CAMPBELL, *Sec'y*, Suffolk, Va.

Transportation Rates.

The following rates to the Exposition have been made by the transportation lines: Season tickets, 80 per cent. of double one way; sixty-day ticket, one and one-third fare plus 25 cents; ten-day ticket, one and one-third fare plus \$2.25. These rates will probably be lessened, or, if not, there are likely to be special excursions from all parts of the country and Canada at low rates.

The following places of interest can be visited as side trips: Jamestown Island, \$1.00; Yorktown, \$1.00; Williamsburg, \$1.95; Washington, \$3.50; Baltimore, \$5.00; New York (Old Dominion Steamship Co.), \$13.00 round trip; Philadelphia, by rail, \$9.00 round trip; Richmond, \$3.50 round trip.

Several watering places are within a few minutes' ride of Norfolk and the Exposition grounds.

For further information address Committee on Transportation, Jamestown Dental Convention: J. Lewis Walker, A. Allison Stores, W. M. Sturgis, Norfolk, Va.

H. WOOD CAMPBELL, *Sec'y Committee on Organization*, Suffolk, Va.

NORTHEASTERN DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Me., at the Hotel Lafayette, October 16, 17, and 18, 1907. Preparations are being made for a valuable and instructive meeting.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

VIRGINIA STATE DENTAL ASSOCIATION.

THE Virginia State Dental Association will hold its annual meeting September 9, 1907, at the Inside Inn, Jamestown Exposition. There will be only a short session, as the activities of our members are being merged with those of the Jamestown Dental Convention. This will be strictly a business meeting; no committees will be appointed, and no work done other than certain important matters of business, which will be designated later in a circular letter to be issued to each member.

W. H. PEARSON, *Asst. Cor. Sec'y*,
Hampton, Va.

NORTHERN IOWA DENTAL SOCIETY.

THE thirteenth annual meeting of the Northern Iowa Dental Society will be held in Sioux City, Iowa, September 4, 5, and 6, 1907.

H. P. WHITE, *Sec'y*,
Sioux City, Iowa.

ARMY DENTAL CORPS.

DENTAL Surg. Raymond E. Ingalls, U. S. A., from temporary duty at Fort Crook, and will return to his proper station, Fort Leavenworth. (June 11, D. Mo.)

Leave for one month is granted Dental Surg. F. Homer Woven, to take effect upon his being relieved from duty at Fort Adams. (June 24, W. D.)

Dental Surg. Douglas E. Foster from further duty at Warwick Barracks, Cebu, to Camp Bumpus, Leyte, for duty. (May 10, D. V.)

Dental Surg. Robert M. Hollingsworth, now at Terre Haute, Ind., will proceed to San Francisco and take the first available transport from that place for the Philippine Islands for assignment to duty. (July 1, W. D.)

Dental Surg. Raymond E. Ingalls from further duty at Fort Leavenworth, to San Francisco, and take the first available transport for the Philippines. (July 2, W. D.)

Examining and Supervising Dental Surg. Robert T. Oliver is detailed to represent the army at the annual meeting of the National Dental Association at Minneapolis, Minn., July 30 to August 2, 1907. (July 9, W. D.)

PRIZE OFFERED BY ROTTERDAM DENTAL SOCIETY.

A GNATHO-DYNAMOMETER WANTED.

THE Rotterdamsche Tandheelkundige Vereeniging offers a reward of *f.* 300 (\$120, £25) for the invention of a gnatho-dynamometer that will be suited for use in dental practice.

The instrument must be able to record a maximum pressure of at least 200 kilograms. Below 20 kgm. the limit of error must not exceed 1 kgm., while with heavier pressure it should remain within 2 kgm.

The bite-contact plates must allow the making of a record within a distance of 1cm.

Although the instrument has only to record the pressure in one direction, it ought to work also with a moderate lateral movement. With the front teeth, only the pressure with edge-to-edge bite, not with overbite, is to be measurable.

The instrument must be simple, strong, and capable of being sterilized as far as it comes in contact with the mouth. The bite-plates

must not do damage to the teeth. When used, the recording apparatus ought to be readjustable.

Competitors are requested to send, free, specimens until October 1, 1908, to the Rotterdamsche Tandheelkundige Vereeniging, 115 Aert van Nesstraat, Rotterdam, accompanied by a motto and a description of the mode of use; and in addition a sealed envelope signed with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, I. J. E. de Vries, Amsterdam; C. H. Witthaus, Rotterdam; besides a technical expert. The jury will make its decision in December 1908.

The result will be communicated to all competitors, and their instruments will be returned.

The prize will be delivered in January 1909, during the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

Dental and technical papers are requested to publish this notice.

M. ISEBREE MOENS, *Sec'y.*

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JUNE 1907.

June 4.

- No. 855,875, to J. BODE. Dentimeter.
 No. 855,931, to F. V. BROOKING. Apparatus for administering anesthetics.
 No. 856,034, to J. N. CROUSE. Process of manufacturing fusible dental fillings, inlays, and crowns.

June 11.

- No. 856,352, to R. L. MAGOON. Mouth-prop.

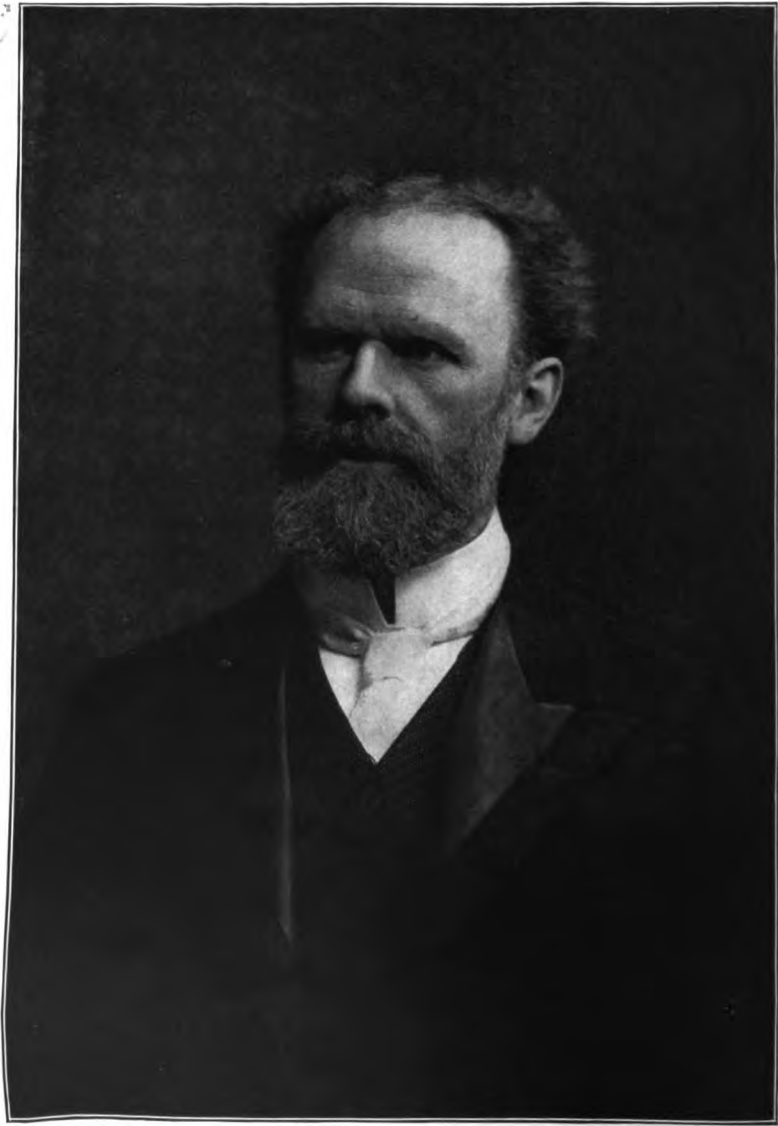
- No. 856,884, to M. H. KNAPP. Attachment for dental articulators.

June 18.

- No. 857,240, to J. A. HENNING. Dental tray.
 No. 857,339, to G. E. FREEBORN. Dental plate swage.

June 25.

- No. 858,193, to L. L. MALLARD. Dental chair.



W. D. Miller.

THE DENTAL COSMOS.

VOL. XLIX.

SEPTEMBER 1907.

No. 9.

ORIGINAL COMMUNICATIONS.

THE DIAGNOSIS AND TREATMENT OF ANTRAL SUPPURATION.

By CORNELIUS G. COAKLEY, M.D., New York City.

(Read before the First District Dental Society of the State of New York,
November 13, 1906.)

WHEN one of your members, Dr. W. B. Dunning, asked me to read a paper on this subject, I considered it a great privilege, feeling that at the conclusion of the discussion many points in reference to the dental etiology of antral suppuration would be made much clearer to me.

The dental surgeon and rhinologist have for some years given considerable study to the etiology, diagnosis, and treatment of suppuration in the maxillary sinus. That I am not as familiar with the excellent work of the former as with that of the latter is to me a matter of much regret. In rhinological literature one only occasionally meets with a reference to the writings of dental surgeons. The views which I put forth this evening are those which have been acquired from the literature—mainly rhinological—that has been accessible to me,

together with my own personal experience in observing the disease.

ETIOLOGY.

On the subject of the etiology of antral suppuration, your clinical experience and ours will probably differ materially.

Acute suppuration. The unfortunate victim of the toothache naturally seeks relief at the hands of his dentist. He is the one who will diagnose and treat a large percentage of the acute cases of dental origin.

Direct infection of the antrum by pus breaking through the tip of a diseased root and penetrating the cavity of the antrum, or by extension through necrosis of the intervening layer of bone, or by extension from dental or periodontal suppuration through the rich anastomosis shown by Strubell (*Monatsschrift für*

Ohrenheilkunde, June 1904) to exist in the bloodvessels supplying the teeth, periodontal structures, and mucosa of the antrum—such are the frequent causes of acute suppuration as seen by dentists. Personally, I see but few of these cases, on an average not over half a dozen a year.

The acute cases of antral suppuration coming under my observation are mostly of nasal origin, secondary to acute inflammation of the nasal mucosa, such as one meets with in severe acute rhinitis, especially of the influenzal type. In addition to the general facial neuralgia experienced by these patients, they often have pain in one or more of the teeth of the upper jaw on the affected side. When such pain is complained of, I always examine the teeth. My knowledge of disease conditions in the teeth is comparatively superficial, so that if I am in doubt as to the cause of the suppuration the patient is referred to his dentist for an expert opinion as to whether they are the cause of the disease.

Chronic suppuration. Although it is comparatively easy to determine in acute cases the dental or nasal origin of antral suppuration, in the chronic cases the disease has usually existed for so long a time that patients forget the train of symptoms which occurred at the onset, by which we might have conjectured which of these two sources was the probable one in any individual instance.

The fact that a patient with chronic suppuration in an antrum has, or has had, diseased teeth in the maxilla of that side, is not to my mind conclusive evidence that those teeth caused the disease. It is very common to find badly diseased teeth, devitalized teeth, inflamed and ulcerating gums, dento-alveolar abscesses, and swelling of the face, with pus-formation between the periosteum and bone of the anterior surface of the maxilla, without any disease of the maxillary sinus. Tilley states (*Laryngoscope*, February 1904, p. 102): "In the past ten years, during which I have seen at least three hundred cases of antral abscess, I have met with only one patient—a girl aged twelve—in whom the teeth were

quite healthy." To my mind this merely proves how seldom one finds a jaw in which the teeth have been or are absolutely healthy. Tilley does not state how many of the 299 of these 300 cases were dental in origin, but leaves the reader to infer that the dental origin is more frequent than most rhinologists believe.

A most excellent review of the literature on the etiology—dental and nasal—of antral suppuration is given by my friend, Dr. Geo. L. Richards, in the *International Dental Journal*, February 1905. How widely opinions differ may be judged from these quotations: B. Fraenkel, from clinical experience, states that "In by far the larger number of cases disease of the teeth and alveoli was the causative factor." Krause considered that "Carious teeth do not bring about empyema."

The clinical histories of my private patients have not been kept in such a way that I can determine the proportion of probable nasal or dental origin. My impression is that less than twenty per cent. could be ascribed to dental causes.

It may be interesting to note that at the University and Bellevue Hospital Medical College clinic for diseases of the nose and throat, there were records kept of 2340 new patients between October 1, 1905, and October 1, 1906. Of these, 59—practically 2½ per cent.—had antrum suppuration, often combined with suppuration in the other sinuses. As we had no dental surgeon to whom to refer these, none received any treatment of the teeth, and at the present time all but four of the recent cases have been cured, we believe, without attention to the teeth. Had diseased teeth still in the mouths of the patients produced the condition, it is unlikely that such good results would have been attained.

DIAGNOSIS.

The diagnosis of antral suppuration may best be divided into the acute and chronic types.

Acute type. In the acute type two

prominent symptoms are complained of—(1) pain, and (2) nasal catarrh. The pain may be limited to the region of the antrum and be most marked in the infra-orbital region near the nose, or radiate to the forehead, the eye, or the temporal and mastoid regions. One or more teeth in the maxilla—the second bicuspid or first or second molar—often ache, and usually do in cases of antral suppuration of dental origin. The fact that a tooth looks healthy to an inexperienced eye is no evidence that it may not be diseased at its root, and thus be the cause of the disease.

The discharge from the nose is a purulent one, and most frequently odorless. At times there is an intensely foul odor to the discharge, noticeable to the patient as well as to others. At one time it was considered that a foul odor in the discharge from an antrum invariably denoted a dental cause for the suppuration. The odor is due to the presence of various putrefactive bacteria, and as these are nearly always found in dental suppuration, the inference was that they gained access to the antrum along with the infecting bacteria. While I am always strongly suspicious of a dental origin in an acute antral suppuration accompanied by odor, my suspicions have not always been well founded. In one case, presumably vomited material entered the antrum while the patient was in the Trendelenberg position subsequent to extirpation of the larynx and caused an acute suppuration, with an exceedingly foul ammoniacal odor. In other cases, of undoubted nasal origin, a foul odor was found when the disease had lasted only a week. In such cases putrefactive bacteria have gained access to the antrum through the nose concomitantly with or soon after the entrance of the pathogenic bacteria. At night the discharge flows from the nose into the naso-pharynx, and is swallowed or hawked down, partially dried, from the naso-pharynx in the morning. Occasionally the anatomical structure of the nose is such that *all* the discharge, even when the patient is in the upright position, passes backward into the pharynx.

Swelling of the face over the antrum is an occasional symptom, and in my experience has been seen more frequently in cases of dental than in those of nasal origin. In the former the swelling begins in the lower region of the face, near the alveolus. It may be limited to this region or extend upward until it involves the loose connective tissue below the orbit, whence it may pass around the inner and outer canthi to the upper lid and even to the lower portion of the forehead, effectually closing the eye on that side. We have, however, seen such a swelling when the pus was entirely external to the antrum, between the periosteum and the bone. In nasal cases the swelling and edema usually appear in the upper region of the antrum and lower lid, and seldom spread down to the alveolus, unless, as in a syphilitic case, a gumma results in necrosis of the anterior wall, with fistula formation near the floor.

In acute cases there is often a rise of a few degrees in temperature, an acceleration of the pulse-rate, a coated tongue, foul breath, and all the symptoms of a mild septic intoxication.

Examination. The examination of a suspected case of antral disease should include a careful examination of the teeth and nasal cavity by transillumination and skiagraphy, and if these give presumptive evidence, irrigation of the cavity under proper aseptic precautions should be performed.

Tapping the bicuspids and molars with a metallic instrument is nearly always accompanied by pain in cases of acute antral suppuration. Often some one tooth is more sensitive than the others. If such be the case, it should be most carefully examined. I have many times failed to detect any disease in such a sensitive tooth, and after irrigating the sinus and relieving the tension, have found that all the sensitiveness had ceased. My belief is that in these cases the roots of such a tooth are separated from the antrum by a thinner layer of bone than usual, and that the pressure within the cavity and the inflamed nerve and bone give rise to an undue sensitiveness in a

healthy or even a carious tooth. One of the sensitive teeth is often found to be carious. On such a patient being referred to his dentist, the report has usually been that the tooth had a superficial caries, which of course needed attention, but probably did not cause the disease in the sinus.

On the other hand, the history of a tooth grumbling for a few days, then aching, followed by a slight swelling of the alveolus, and later a purulent discharge from the nose, would lead one most certainly to expect to find a dental cause for the antral disease. In such a case, too, it may be found that at least three teeth are sensitive to tapping—the one really diseased and the immediate neighbor on each side of it. In two cases with this history, the crowns of all the teeth, apart from having a few fillings, appeared to be healthy. These patients' dentists advised the removal of teeth, at the root of which in each case was found a roundish mass, the size of a French pea, of what looked to me like granulation tissue. There was the smallest amount of secretion present around the mass, but a fine probe could be passed directly through the root-socket into the antrum.

Examination of the nasal cavity usually shows pus coming from beneath the anterior end of the middle turbinate. The entire nasal cavity may be filled with the secretion; if the patient has recently blown his nose, none may be seen for a few minutes. In case no pus is seen anteriorly, an examination of the posterior nares may show a streak of pus flowing down over the upper surface of the posterior end of the inferior turbinate. The mucosa of the nose is always more or less swollen. In cases of nasal origin there is apt to be a more general congestion of the mucosa, while in some of those of dental origin I have noticed the greatest swelling in the mucosa of the outer wall, that of the septum not being involved to so great an extent.

I have only met with one case of suppuration of the maxillary sinus—of course not considering as such suppuration of a dental cyst in the antrum, in which the

pus did not discharge from the antrum into the nose.

With the presence of pus in the nose I invariably transilluminate the antrum. I do not know how frequently dentists resort to this procedure, but I wish to urge it upon you very strongly. In sinus disease of dental origin you can use it to great advantage, not only as a diagnostic aid, but as a means of determining the progress of your case while under treatment. To be effectual, transillumination must be done in an absolutely dark room, and there must be a means of regulating the amount of light used in each case in proportion to the thickness of the cranium of the individual. For the latter purpose a lamp of from fifteen to twenty volts' capacity should be used, and the current controlled by a rheostat, so that the light may be increased or diminished at will. Normal heads often show slight variation in the illumination of the two antra. With practice this difference may be gradually learned, and all darkening in an antrum beyond this variation should be investigated. I have often been able by transillumination alone to seek and find antral suppuration, where, otherwise, from the history or nasal examination, it might have remained unsuspected. True, I have occasionally been led to puncture an antrum where the shadow seemed to indicate pus, and have found none, but as the procedure, when carefully and aseptically performed, is neither very painful nor dangerous, no harm results.

The typical illumination in unilateral disease of a maxillary sinus once seen cannot be forgotten. The whole of the superior maxillary region of the healthy side is well illuminated, and when the eyelids are separated the pupil on that side can be seen to be well illuminated. By contrast, the illumination on the diseased side is poorer, especially in the upper portion of the maxillary region, where a considerable shadow is observed, and in addition there is usually an absence of illumination of the pupil on the affected side. That the shadow is not due only to the pus in the antrum may be determined very readily by again trans-

illuminating a patient after irrigating the antrum. It will then be found that there is a diminution in the depth of the shadow, but still a marked difference between the diseased and the healthy side. This is due to the increased vascularity and thickening of the mucous membrane of the antrum and its bony walls. When as a result of treatment the illumination of the two sides of the face approaches an equal brilliancy, one can be sure that the inflammatory process is subsiding and the treatment efficacious. Of course, to properly judge of this progress one must be sure to use the same degree of illumination at each visit, hence another reason for having a graduated rheostat for knowing and recording the voltage used for the illumination.

Transillumination is apt to be misleading in the presence of infiltration of the tissues of the cheek external to the antrum. The shadow is quite like that in antral suppuration—except that it is lower—but there may be a faint pupil illumination. In children under approximately twelve years of age, transillumination, owing to the imperfectly developed antra, has been found of little or no value.

Skiagraphy. During the past few years much help has been derived by the dentist and the rhinologist from the knowledge obtained by a negative exposed to the X ray passing through the alveolar process, or antero-posteriorly through the head. By the former method the dentist can determine the size, shape, and condition of tooth-roots—filled or otherwise—the presence of misplaced or unerupted teeth, spiculæ of bone fractured in extracting a tooth, and retained portions of a root broken in the process of extraction. Any of these conditions may be a factor in causing the maxillary sinusitis, and could not so easily have been detected without the use of the X ray. The rhinologist, by taking an antero-posterior picture of the head, may discover an ethmoiditis or frontal sinusitis draining into the antrum as a cause of the failure to cure what seemed a simple inflammation of the maxillary sinus.

Irrigation. However presumptive may seem any or all combined of the above symptoms and signs of antral suppuration, there is but one sure method of diagnosis, namely, irrigation of the cavity and the washing out of the secretion. There are many routes by which an antrum may be irrigated, according to the circumstances of the case:

(1) Through a root-socket after extraction of a tooth. This method of course should only be considered in the case of a tooth so badly diseased as to require extraction.

(2) Through the alveolar process where a tooth has previously been extracted. (A difficult method, owing to atrophy of the process and liability to miss the antrum and penetrate the cheek or hard palate; not considered good surgery by most rhinologists.)

(3) Puncturing of the anterior wall of the antrum in the canine fossa, after cocainization. Rhinologists almost never employ this method.

(4) Cocainization of the middle meatus of the nose, and with a suitably bent cannula searching for and irrigating through the normal ostium of the sinus. This method is the one of election by a few rhinologists, but on account of the pain and difficulty in locating the ostium, I seldom employ it.

(5) The method of election by the majority of rhinologists—cocainization beneath the inferior turbinate and passing a trocar through the outer wall of the nose beneath the inferior turbinate into the antrum. The outer wall of the nose, to about one and one-quarter to one and one-half inches within the nostril, is usually quite thin, readily punctured, and practically painless when the tissues are properly cocainized. All instruments should be thoroughly sterilized by boiling, the nose first doused free from all pus, and only sterilized normal saline solution used for purposes of irrigating the antrum. The fluid, injected through the cannula with a syringe, enters the lower part of the antrum and emerges—mixed with whatever secretion is contained in the cavity—at the ostium maxillare, and when the head is inclined

downward the mixed secretion falls into a pus-basin held below the chin. Irrigation always causes pain in the teeth whenever it is necessary to use much force to wash out an antrum.

I know of but two sources of error in making the diagnosis by the puncture method: (a) That the expelled secretion may really come from the nasal cavities and not the antrum. This should be guarded against by inspecting the nose, and determining that no secretion lurks there after douching. (b) That the antrum may be bifid, the trocar entering only the healthy cavity. This is a rare condition, illustrated by the following case, which I once treated:

Mrs. B., age sixty-seven. Foul-smelling, purulent discharge from right nasal cavity, of three years' standing. Pus seen, on anterior rhinoscopy, coming from middle meatus. Transillumination—right antrum very dark, no pupil illumination, left antrum and pupil well illumined. The upper first molar was the only tooth remaining on the right side, and on the left side the lateral incisor had ached considerably, was loose, and the gum had receded considerably. I punctured the right antrum through the inferior meatus, and the return fluid contained thin, granular, very fetid pus. Her dentist advised, as the tooth was a devitalized one, extraction and opening the antrum through the root-socket. Gas anesthesia and tooth-extraction by Dr. Hasbrouck. The probe did not pass through the alveolus into the antrum. With a trocar I bored into the antrum through about an eighth of an inch of bone. When the patient returned to consciousness I irrigated the antrum through that opening, but the return fluid was only slightly bloody, and contained no pus. I packed iodoform gauze into the antrum through the opening. On each of the two succeeding days the gauze was removed and the antrum irrigated, but no pus was evacuated. In the nose the presence of pus was still evident.

The antrum was again punctured through the inferior meatus, and this time a foul-smelling pus came away. A wide opening was made through the inferior meatus and the case was cured. A probe passed through the root-socket into the antrum and another passed through the nasal opening did not meet. In this case there was evidently a complete septum dividing the antrum into two

distinct cavities, each having its own opening into the nose.

Chronic stage. Whether originally of dental or nasal origin, chronic suppuration of the antrum is practically always found as a sequela of an acute suppuration which was either not recognized and did not spontaneously get well, or else was an acute case which in spite of the treatment given had continued to discharge. Rhinologists recognize a type of this disease in which there is little pathological change in the mucosa of the antrum, although the cavity is filled with pus. These cases they call "reservoir" antra. The pus which they contain comes from the ethmoidal cells or frontal sinus.

There is but one constant symptom in chronic disease of the antra, viz, a purulent rhinitis—"catarrh," as the patient so frequently designates it. The discharge varies considerably in amount at different times. When increased, these patients say they have "taken cold," which they do quite frequently. There may or may not be an odor to the discharge, but the proportion of cases in which there is a foul-smelling discharge is much greater than in the acute cases. Fortunately the patients themselves are seldom aware of this odor, for their sense of smell is blunted for that particular one, although often keen for all others. The cause of the odor is discussed under the acute cases.

A dull headache or heaviness may at times be experienced, but seldom of the neuralgic type, as in acute cases. The teeth seldom give pain, for if a tooth was originally at fault, the local disease has either subsided spontaneously or been treated and cured by a dentist, or the offending member has been extracted.

The rhinologist diagnoses chronic antrum suppuration as the result of an examination of the nose conducted as described in connection with the acute cases. Owing to the occasional intermittent character of the discharge from the antrum into the nose, and the frequent use these patients make of the nasal douche, it occasionally happens that antral suppuration is overlooked by the rhinologist on the patient's first visit to

the office. This oversight would be made less frequently if we all employed transillumination of the antra as a routine practice in patients suffering from "chronic catarrh." There is one condition which I have sometimes noticed in chronic suppuration that is less frequently seen in acute cases—viz, a congestion of the mucous membrane and dilatation of the veins of the gingivobuccal fold on the affected side.

It would interest me very much to know whether there is any local condition of the teeth, other than manifest suppuration in a tooth-pulp, by which a dental surgeon's attention is directed to the antrum in chronic suppuration.

PROGNOSIS.

The prognosis in *acute* maxillary sinusitis is good, provided the etiological factor be removed and the proper drainage afforded. Undoubtedly, many of the milder cases of nasal origin recover spontaneously without treatment and even without a diagnosis having been made. Whether the same may be said of those of dental origin, I do not know. Probably all of the chronic cases we see began as acute cases months or years before, and might have been cured had they been recognized early and properly treated. The antra are not so closely related to the brain as are the ethmoid cells and frontal sinuses, so the danger to life is seldom great.

There is one danger in failing to recognize acute suppuration in the antrum and allowing the process to become chronic which is perhaps not realized. I refer to the fact that secondary involvement of the ethmoidal cells, the frontal sinuses, and probably later the sphenoid as well, may occur. Rhinologists are well aware that pus from the upper cell region, ethmoid and frontal, may infect an antrum, but I am sure the reverse process has occurred in at least the following three of my cases, all of dental origin:

Mr. B., age thirty-seven. Tooth protruded into the antrum; tooth was extracted; small hole in alveolus and occasional irrigation for two and one-half years. When I saw him

the frontal and ethmoidal cells on the same side were suppurating.

Dr. Van W., age twenty-eight. Tooth protruded into the antrum; tooth extracted; no irrigation. Pus flowed from the alveolus for about two weeks, and then the discharge ceased. Nasal catarrh with foul odor occurred for one year on the same side as the antrum. Finally there was intense frontal pain on the same side. The frontal and ethmoidal cells were involved; there was exophthalmos. Radical operation on frontal, ethmoid, and antrum.

Mrs. B., age fifty-six. An infected tooth had been cleaned and filled, but upon its again becoming infected a nasal discharge followed. The filling was removed and the pulp washed out daily for two weeks. Pain and swelling occurred over the maxilla, with foul nasal discharge. The tooth was extracted, and the antrum washed out through the alveolus. Periodic closing and opening of the aperture in the alveolus was effected. One year later she was referred to me for antrum treatment; found frontal and ethmoidal cells also involved. Radical operation.

The probable method of extension in these cases was through the infection first of the ethmoid cells, many of which are separated from the upper inner portion of the antrum by a very thin partition.

The prognosis in *chronic* cases should be more guarded. A large proportion may be cured by the simpler methods of drainage, but every now and then I meet with a case that only a most radical operation can cure.

TREATMENT.

In speaking of the treatment of antral suppuration I will confine myself to dealing simply with cases in which the teeth are the presumptive cause. I will begin by asking a question: What do dental surgeons advise with reference to a tooth which has been so diseased as directly or indirectly to infect an antrum? Should the tooth be immediately extracted, or is it possible to relieve the patient of the acute symptoms of the sinus disease, and then to so treat the tooth that it may remain a useful member and free from reasonable danger of reinfecting the antrum?

Up to the present time I have invariably had the diseased tooth extracted, often upon the advice of the patient's dentist. Unfortunately, it has sometimes been difficult to determine which tooth was the offending member, and some of my patients have had a sound tooth extracted, and later on the diseased one.

Once the exciting cause is removed, there is but one plan of treatment in the case of an abscess in the antrum, just as in abscesses elsewhere in the body, viz, *good efficient drainage*. Let us be guided by sound surgical principles and procedures. No modern surgeon would make a pinhole opening in a large abscess cavity. He would open it widely at a point where he can get the best drainage, and in a few days the reparative process would result in a cure. We all know that suppuration in the antrum is not exactly analogous to an abscess, for we have a secreting mucous membrane inclosed in a hollow bony cavity. The inflammation causes a considerable edema and infiltration in the mucous membrane, with excessive secretion from the glands and exudation from the blood-vessels and lymphatics, all of which make up the discharge. The normal antrum is kept dry by the current of air which enters the nose absorbing the moisture as fast as it is secreted. A diseased antrum cannot be so affected by the inspired air-current for two reasons: First, there is always a swelling of the mucosa of the middle turbinate and outer wall of the nose in the region of the ostium that prevents the adequate access of air to that region, and second, the swelling of the mucosa within the antrum virtually blocks the ostium to all but the secretion in the antrum, which is forced out under slight or considerable pressure. Drainage and restoration of the normal ventilation are the two objects to be sought for.

In the early days of rhinology, as in other branches of surgery, many methods of operating were advocated which in later years have been supplanted by better ones.

One of the earliest methods of treat-

ing antral disease was by extracting a tooth or boring through an empty tooth-socket and inserting a drainage tube of rubber or metal. Many cases have been cured in this way. I have known of cases wearing such a tube for years. I formerly employed it, but have discarded it. In my opinion an alveolar opening is only permissible in the very acute cases when a tooth evidently the cause of the trouble has been extracted. The opening through the alveolus should be of the full diameter of the crown of the extracted tooth, and no packing is used except aseptic gauze at meal-times to prevent the entrance of food particles into the antrum. The opening of course closes rapidly, but if the case is not healed in a few days I would advise operating by the nasal route. Most rhinologists and dental surgeons, when operating through the alveoli, make too small an opening to give good drainage. They inject all sorts of antiseptic fluids into the antrum. These do not kill the bacteria, and only irritate, inflame, and tend to keep up the disease process. If irrigation is to be used, let it be of normal saline solution. The insertion of a drainage tube of any sort is a delusion on the part of patient and physician. I never saw a drainage tube placed in an antrum through such an opening that did the work effectually. The tube, if cut off level with the floor of the antrum, is quickly grown over at its upper end with the edematous mucous membrane of the antrum, and no drainage results. To overcome this it is allowed to project one-quarter of an inch or more above the floor of the cavity, and then of course it does not drain! Granulations always form around the tube, as can be easily demonstrated whenever the latter is removed and the cavity inspected. The proportion of acute cases treated in this way that go on secreting for weeks and months and finally become chronic is, I feel sure, greater than that treated by any other method.

The canine fossa route is a close second to the alveolar for unsatisfactory results in treatment. It has the merit that it can be made under cocain anesthesia

with little or no pain, but the same objection as to imperfect tube drainage is present.

The nasal route for approaching a diseased antrum has been to me the most satisfactory method of treating not only the acute but also the chronic cases. I cannot recall a single acute case—and by such I mean all cases the history of which points to a discharge for a period of a few days up to a month or six weeks—that has not been speedily cured by this method. In the chronic cases a large proportion have been entirely relieved of their secretion, although occasionally a case has had a recurrence of the discharge for a few days during and following an attack of acute rhinitis. The discomfort, however, in these cases has been very slight, and the majority of the patients have not been aware of any special sinus involvement. They merely had a somewhat more profuse discharge from the nose than the average patient with a cold in the head.

In connection with the chronic cases I refer to that class of cases not complicated by severe ethmoidal and frontal sinus suppuration, for we realize that in the latter case continual secretion in the antrum may come from the ethmoidal and frontal sinuses. It has been my common observation that if an acute maxillary sinusitis accompanying an acute rhinitis be seen early, and the antrum be irrigated through diagnostic puncture in the inferior meatus as described, one, two, or three such irrigations at intervals of forty-eight hours will suffice for a cure. If the discharge persist beyond that time I feel that one is then justified in making a considerable opening beneath the inferior turbinate, so that continual drainage may take place from the antrum into the nose. Various operators use a somewhat differing technique for this operation, but the object attained by all is the production of a large opening through the antral wall at the level of the floor of the nasal cavity, and removal of so much of the anterior portion of the inferior turbinate as lies external to that opening. In this way continuous drainage is attained. Each time the

patient blows his nose the air is forced into the antrum and the secretion forced out, thus allowing for good ventilation and relief of all tension in the cavity, and a speedy absorption of the inflammatory products in the mucous membrane of the antrum.

The operation should be done under cocain anesthesia, a 10 per cent. solution being rubbed over the nasal wall of the antrum and adjacent parts to the inferior turbinate at intervals of five minutes. Adrenalin 1:10,000 materially aids in contracting the tissues and keeping the operative field free from blood. From twenty to thirty minutes suffice for such a thorough anesthetization that it is rare for a nervous patient to feel much if any pain during the operation. With scissors and snare I cut away about the anterior third of the middle turbinate from its attachment, and with Myles' punch, driven by a mallet, rapidly punch a hole into the antrum at the level of the floor of the nose. I have found a pair of Grunwald's cutting forceps most serviceable for enlarging this opening to any desired size. I have quite frequently used a large bone scoop to smooth the ridge at the floor of the nose. The resulting opening into the antrum is one that will readily allow for the passage of one's index finger. At the conclusion of the operation I blow into the nostril on the operated side about five grains of powdered suprarenal gland. This usually suffices to contract the bloodvessels sufficiently until a blood-clot is formed, and consequently there is very little secondary hemorrhage. Formerly the nose was packed with gauze, but this procedure does not allow so firm a clot to form, and induces hemorrhage. The bleeding is usually quite profuse when the gauze is removed the day following the operation. For about a week following, especially if there be much odor to the discharge, the antrum may be irrigated daily with warm normal saline solution. After that no care is given to the case beyond weekly inspection and transillumination just to judge of the progress of the treatment. Granulations spring up around the mar-

gins of the opening, and at the end of three or four weeks they greatly diminish its size. If these are cocaineized and removed with cutting forceps they are not apt to recur, and the opening will again be at least half the original size and sufficient for all purposes of drainage.

In a few cases the discharge continues for months, with variations—sometimes more, sometimes less. If the patient be dissatisfied with his condition, and none of the cells in the upper tier, ethmoidal or frontal, are involved, it may become necessary to decide upon a more radical procedure for the cure of the disease. With many rhinologists the Caldwell-Luc operation is the favorite one for this class. It consists in widely opening the antrum through the canine fossa, the inspection of the entire cavity, more or less thorough curettage of the mucous membrane, greatly enlarging the opening into the nose, the removal of the larger portion of the naso-antral wall, packing the antrum through the mouth-wound with gauze, and pushing the approximal end of the gauze through the naso-antral wall into the nasal cavity. The tissues over the external antral wall are sewn together or allowed to fall into apposition, so that the mouth-wound closes in two or three days. All subsequent packing and treatment of the antrum is done through the nose and naso-antral wall. I have tried this method, but not having been pleased with the results obtained, have since abandoned it.

Berens, in the *Laryngoscope*, November 1904, advocates a modification of the Jansen method, by which the antrum is widely opened through the canine fossa as in the Caldwell-Luc operation; the entire mucous membrane of the antrum is removed, leaving the bone perfectly bare. He then removes the bony antro-nasal wall without destruction of the mucous membrane on the nasal side, removes the inferior turbinate from the overlying tissues, and stitches the mucous membrane of the nasal surface of the antral wall and that of the inferior turbinate into the cavity of the antrum. These membranes partially line the bare

bony wall of the antrum, and serve as foci for the regeneration of the new connective tissue which lines the remainder of the antrum. In these cases the cavity of the antrum is practically made a part of the inferior and middle meatus of the nose. The facial wound is sewn up, the cavity lightly packed with gauze—which is removed in a few days—and no further packing and only occasional douching is resorted to.

The method which I have usually advised for the cure of an obstinate antrum suppuration which was not relieved by the nasal route is that of obliterating the antrum. For this purpose an incision is made as in the Caldwell-Luc and Jansen-Berens operations, and the mucous membrane of the antrum is removed with the utmost thoroughness, so that the cavity of the antrum is made entirely bare. I think it is advisable to disturb the nasal wall, especially in the region of the normal ostium, as little as is possible, as the granulations in that region are most advantageous in helping to fill the cavity. At the conclusion of the operation the antrum is packed with iodoform gauze, the margins of the wound in the cheek being kept well separated by the gauze to allow of easy packing and inspection of the cavity. In a week the gauze is removed and reinserted. These packings are kept up for three or four weeks. The granulation tissue continues to grow and the entire antrum is filled with connective tissue and obliterated.

My preference for this operation is that having obliterated the cavity, no subsequent rhinitis can possibly infect it, as is possible in either of the other types of operation.

In conclusion, I would say that the last three types of radical operation have only been found necessary where some peculiar anatomical arrangement of the antrum existed in which adequate drainage was not afforded by the large opening in the nasal wall near the floor. It is only by widely opening the antrum that these anatomical peculiarities could possibly have been discovered and properly managed.

SOME ABSCESSSES OF DENTAL ORIGIN WHICH OPEN OUTSIDE THE MOUTH.

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(Read before the Northeastern Dental Association, at its annual meeting, Boston, Mass., October 17, 1906.)

SO much has been written about dento-alveolar abscesses lately that there remains but little to add at the present time. One class, however, of abscesses associated with the teeth has received scarcely any attention—namely, those which do not “break” or open either into the vestibule of the mouth or into the mouth itself. There are many abscesses of dental origin that break or open upon the surface of the face or neck, and there are also those that break or open into the pneumatic cavities of the face. It is of the latter cases—those in which the upper teeth alone are involved—that I wish now to speak.

The pus from an abscess associated with any of the incisors that does not pass directly into the vestibule of the mouth, occasionally passes backward between the two plates of bone forming the roof of the mouth and the floor of the nose, and may then point or open into the mouth or nasal chamber, or even into the maxillary sinus. Under this head I reported a very interesting case in the Section on Laryngology and Otology of the American Medical Association last June:

A patient of Dr. Cupit's of Philadelphia had been suffering from severe pain throughout the right side of the face, but especially in the upper part of the nasal and frontal regions. An X-ray examination was made by Dr. Pfahler, which demonstrated that artificial crowns had been placed on the two incisors on that side, with pins passing into the root-canals. The radiograph also showed that a great change in the structure of the cancellated tissue and upper plate of bone had taken

place over the region of the incisors, especially over the lateral incisors; the characteristics of the cancellated tissue had been lost, showing that destruction of the bony tissue had occurred and the apex of the lateral incisor was in what might be termed a pus chamber. The upper plate of bone had been pushed upward until it came in contact with the inferior turbinated bone, and a passageway was established between the two plates of bone which form the septum between the nasal chamber and the maxillary sinus. This passageway had its outlet into the nose near the ostium maxillare. The radiographs also showed a thick or cloudy condition of the fluid in the maxillary and frontal sinuses, thus giving conclusive evidence that the infection had passed from the incisors to the maxillary sinus, thence through the passageway to the upper part of the nasal chamber and the frontal sinus.

The general anatomic position of the root of the canine indicates that abscesses associated with it seldom point and open anywhere but into the vestibule of the mouth, but there are exceptions when the apex is deeply located, and there have been cases where an abscess has pointed through the outer wall of the nasal chamber, and again where it has discharged into the maxillary sinus. Abscesses from the premolars occasionally open into the maxillary sinus, and sometimes into the nasal chamber. The latter is what usually occurs when the nasal chamber extends outward over the roots of the molars to the external wall of the maxilla.

Some abscesses that open into the maxillary sinus may exist for years without being detected, the pus or infectious matter being carried off with the secretions of the sinus. An abscess of this kind often becomes a source of great annoyance to the patient by causing the breath to assume a foul odor. The infection may extend through the ostium maxillare, the hiatus semilunaris, and the ostium frontalis, infecting all these regions, and even affecting the membranes of the brain by penetrating the bony wall of the sinus. There are cases where the bony septum is incomplete, when the brain may extend into the sinus, or there may be only a membranous division between the brain-case and the sinus. The cranium may also be entered through the cribriform plate of the ethmoid by the passage of the infection from the upper portion of the nasal fossa. The results of infection of the cerebral membranes may be very serious. I could report several cases of this character.

While infection from the source under consideration may extend to the regions spoken of, it can also pass into the alimentary canal and the lungs, thus causing great damage. Usually, however, the alimentary canal is immune to such invasion, but the constant contact of infectious matter will eventually cause the infection to become implanted in the walls of the stomach or other regions of the alimentary canal. This is more liable to take place after a period of illness, especially in the case of diseases in which the vital resistance of the alimentary canal is lowered.

The early diagnosis of abscesses associated with the upper teeth which have discharged into the nasal chamber or maxillary sinus is often difficult. Some years ago Dr. Kirk called attention to cases of threatened abscesses of the upper posterior teeth which cause great pain and then during treatment suddenly subside, from which fact the practitioner is apt to assume that a cure has been effected, when in reality the relief is due to the discharge of pus into the sinus, as already stated. The difficulty of diagnosis may be due to the fact that the teeth do

not emit the typical percussion sound, and a suspected devitalized tooth may show no evidence of such a condition even if the filling be removed from the canals. When a complete history of the teeth is kept by a competent and exacting dentist it is of great value. Very few dentists, however, keep the required history, and consequently the practitioner who makes it part of his special work to search for such teeth usually has to get the necessary information from other sources. Too much stress cannot be laid upon the importance of keeping the full clinical record of every tooth from which infection of the air-spaces of the bony structures of the face may arise.

The X-ray examinations have become useful in diagnosis, especially when a full-sized plate large enough to take in the whole face is used. These examinations should be made both laterally and antero-posteriorly in order to obtain a correct idea of the parts involved. The antero-posterior examination is made by placing the plate against the face, with the tube a little below the occiput. The two pictures will usually demonstrate the approximate relation of the teeth to the maxillary sinus, and will also indicate pathological conditions in this or other regions of the internal portion of the face.

If the diagnosis be once established that an abscess associated with a tooth has opened into the nasal chamber or maxillary sinus, I believe it good surgery to extract that tooth, and give good drainage to whatever parts have become infected.

I now wish to speak of some of the factors that make it necessary to vary the treatment of abscesses associated with the teeth. I do not now refer particularly to the class which I have just outlined, but to dento-alveolar abscesses in general.

Abscesses are apt to occur at any period of life, even in children before the eruption of the teeth. The nature of anatomic and physiological actions is constantly undergoing changes throughout the entire periods of life. If these facts be accepted, then the treatment

of pathological conditions at different periods of life cannot be of a uniform character.

Again, the various teeth differ from each other in anatomic structure. They may vary in function, in their relative position in the jaws, and in their relation to associated structures of the jaws—such as the nasal chamber, maxillary sinus, floor of the mouth, and upper portion of the neck. The roots likewise vary in appearance and in anatomic characteristics and position, some roots being covered only by a thin alveolar plate, others being deeply embedded in the alveolus; again, some are in close relation to the nasal chamber, others to the maxillary sinus, and others still to the inferior dental nerves and vessels, and these relations differ in each individual, no two cases being alike. Even in the same individual the anatomic relations will differ on the two sides. In the treatment of pathological conditions these anatomic variations must be considered. The position of the opening of an abscess associated with the teeth varies greatly. It may, as it commonly does, break into the vestibule of the mouth. Those of the mandible may discharge externally along any portion of the body of the mandible,

or even down in the neck, or into the pharynx. Those of the maxilla may break into the nasal chamber, maxillary sinus, or even into the zygomatic fossa. So they require treatment according to circumstances, as no rule can be established that would cover all cases. Another great factor, and perhaps the most important of all, is the personal equation of the patient. In a patient of high resistive power toward infection, the treatment of abscesses must necessarily be quite different from that of one in whom the resistive power is almost lacking. While the healthy individual is practically immune to extensive invasions of the class of bacteria concerned in the causation of dento-alveolar suppurations, yet, on the other hand, every possible artificial aid must be brought to bear to prevent infection of any kind from occurring in patients whose vital tone is below normal.

It is for these reasons that no fixed rules can be established for the treatment of all cases of abscesses associated with the teeth. Even in the same individual at different times and under different circumstances the resistive and restorative power changes, and consequently the treatment must likewise vary.

THE RETENTION OF DECIDUOUS TEETH IN ADULTS.

By SAMUEL DOSKOW, D.D.S., White Haven, Pa.

(Read at the forty-fourth annual meeting of the Susquehanna Dental Association, held in Scranton, May 21, 1907.)

THE presence of deciduous teeth in adults has doubtless been observed by many practitioners. The apparent harmlessness of their presence may be regarded as the cause for the little attention the subject has received from the profession. It was with the object of determining, if possible, the cause of this phenomenon that I undertook to make a

close investigation of the subject, and as such I lay it before you.

Nature has provided us with two sets of masticatory organs for the proper preparation of food, and ultimately for the proper preservation of the body economy. Each set is so designed as to fully carry out the work assigned to it in the different stages of life; and at no time,

beginning with the third year of life, is the oral cavity to be without the full complement of teeth as regulated by the process of exfoliation of the deciduous and the eruption of the permanent teeth. This process is influenced by the general systemic condition of the individual. This holds good for every phenomenon observed in life. As soon as one part of the system is incapacitated, in one form or another, from fully performing the work assigned to it, impaired function is noticed in another region to a degree in proportion to the interdependence of the two regions. And as no one part of the system can be regarded as totally independent, functionally, of the whole, as soon as impairment of function is observed in any one region of the body the natural conclusion is that a derangement of the entire system is wholly or partially responsible for it.

THE PROCESS OF TOOTH-DEVELOPMENT.

In following out carefully the intricate and extensive process of development of both deciduous and permanent teeth, it becomes imperative that we have an approximate understanding of how the entire process or a part of it, could be interrupted through any fault in the metabolic activity of the system. Commencing, as the process of development does, at about the sixth week of fetal life, and not reaching completion until about the twenty-first year of life, it extends over a period during which the human economy may be subject to innumerable disorders.

The macroscopic characteristics of the teeth in individuals who have suffered during childhood from typhoid fever or other ailments equally severe—namely, the teeth dotted or presenting crescent-like grooves, more marked on the incisors and less on the canines or first bicuspids—are sufficient proof to substantiate this assertion. Not only the manifestation of one ailment, but also the periodic or recurrent attacks, the severity, and the precise time of its occurrence could be determined by the abnormal characteristics of the teeth.

By reasoning from these premises we

come to the conclusion that—excluding cases where resorption was prevented through external means, such as death of the pulp as a result of caries or other means—the retention of deciduous teeth beyond the normal time of their exfoliation is due solely to faulty metabolism. And as my observation of these cases has been only among individuals either afflicted with tuberculosis or presenting a family history of this disease, the idea suggested itself to me that it might be the result of those forms of disordered metabolism characteristic of the hypoacid diathesis, which, according to Michaels and Kirk, is a predisposing influence to tuberculosis.

Bearing in mind that hypoacidity is a condition of over-oxidation in which the hydrations are superior to normal, and in which there is a decrease in organic acidity and an increase of the saline chlorids excreted from the economy, we have a probable explanation of the failure of resorption and exfoliation in some cases. According to Peirce (*DENTAL COSMOS*, vol. xxvi, page 449), and Burchard (*"Dental Pathology,"* 2d edition, page 195), resorption of the deciduous roots is a physiological process due to the action of a soluble acid fluid secreted by the giant cells or odontoclasts, which exercises a solvent action upon the root. Under normal conditions this process lasts about three and one-half years, the probable length of time required for the resorption of each root. As hypoacidity lessens the quantity of organic acids in the system, it consequently affects the resorbent organ in the same way, so that it is no longer capable of carrying out the work assigned to it.

EXAMINATION OF TUBERCULOUS PATIENTS.

In order to verify the above deductions it was deemed necessary to find out to what extent this condition is prevalent among tuberculous subjects. To that effect I examined all the patients at the White Haven Sanatorium. And while it did not offer as advantageous a field for study as I had thought it would, suf-

ficient evidence was secured in favor of the above expounded theory. The difficulty that confronted me was that a large majority of the patients had lost most of their teeth through extraction. To overcome this possible source of error, I confined myself only to those cases that presented complete dentures, or as nearly complete as possible.

Of 114 cases that I examined, eleven presented retained deciduous teeth. Six of them presented a family history of tuberculosis. All had more than one deciduous tooth. Altogether there were seven cases with retained upper canines. In one case the lower canine was in place; in two cases the lateral incisors; in four the second molars, and in addition, in three of the latter, the canines were in place, and therefore these were also classified in the first group. In all the cases the deciduous teeth were sound, showing no sign of decay, although this was not the case with the adjacent permanent teeth. The deciduous teeth appeared to be equally as firm in their sockets as any of the permanent ones.

THEORIES OF THE RESORPTION PROCESS.

The contention of some authors, that resorption of the deciduous teeth is due to the pressure of the developed erupting crowns of the permanent teeth, is disproved by the fact that in some cases the permanent teeth erupt and remain in the arch beside the deciduous. In three of the cases that I examined the permanent canines erupted inside the arch.

Another case that came to my notice since the above observations were made fully convinced me that it is a lack of vital energy that is the paramount cause in the retention of deciduous teeth.

A young lady of about eighteen years of age presented herself for treatment. On examining her mouth I found that the upper lateral incisors were missing, while in the lower jaw the deciduous central incisors were in place. They revealed no sign of decay, and were as firm in their sockets as their permanent neighbors. On inquiring into the history

of the family I learned that her mother died of pulmonary tuberculosis, and although the daughter does not appear to suffer from the same ailment, nevertheless she is feeble in health, and all the efforts of physicians to build up her system are of no avail. She may be regarded as a fit subject for the tubercular camp.

The question may be asked, If it be a systemic condition that is responsible for the retention of the deciduous teeth, why does it not act similarly in all cases of hypoacidity? Also, why does it not affect the process of resorption of the roots of all the deciduous teeth, instead of only one or two in each case? In answer to these propositions I may state that here, as in the case of other abnormal processes, alternating periods of immunity and susceptibility govern the extent and intensity of the pathological involvement. But there is also a hypothetical answer that may be framed on general principles. There are fluctuations in the organic human system as there are in the physical world. No state is constant, even during a minimum unit of time. And as in the physical world certain phenomena occur only under certain favorable conditions that seem totally unintelligible to men, so, in the case under consideration, it seems due to an action, under favorable conditions, whose sole relation is to the region immediately concerned. There is also this to be remembered: the study of diathetics in general is as yet in its infancy, and no successful attempt has as yet been made to determine the true nature and remote influence of any of the diatheses.

THE QUESTION OF EXTRACTION.

To resort to the extraction of the deciduous teeth, in the hope that the permanent will thus be enabled to erupt and come into place, is not an advisable procedure. While this end may be attained in some cases, in others the issue is not so satisfactory, this course resulting in an open, unsightly gap. It would be advisable where extraction is contemplated to have a radiograph made, in order to de-

termine the presence and proximity of the permanent tooth.

In full dentures presenting deciduous teeth, these will be found located at about one-sixteenth to one-eighth inch below the incisive or masticatory line of the permanent teeth. Retained deciduous teeth, as far as the writer has been able to judge, play no part in mastication. While they appear to be apparently as firm in their sockets as the permanent teeth, yet they seem to be incapable of withstanding any stress of mastication, as was proved by the following case:

In his effort to improve the condition of the mouth of a patient, a colleague decided upon crowning a deciduous upper canine. The patient was a young lady of about twenty years of age, of the pure

Irish type, one of the most susceptible to tuberculosis. The tooth was very firm in the socket and appeared to have a long root. A banded porcelain crown was attached and the patient discharged. About a week later the patient appeared with the crown in her hand, complaining that it would not stay. On examination it was found that the root had been entirely resorbed, and the crown cast off, as a foreign body would be, thus proving that as soon as stress was brought to bear upon it, it excited the odontoclasts to activity, resulting in the complete resorption of the root. While this case has no direct bearing on the subject, yet I thought it worth while mentioning, in the hope that it may be of some help in the further elucidation of the subject.

A CASE OF CONGENITAL TOTAL ABSENCE OF THE PERMANENT TEETH.

By Dr. THORVALD KJÆR, Copenhagen, Denmark.

THE case which I shall here describe seems to me to present unusually interesting features. The literature of the subject in question contains very few similar cases.

In his "Traité des Anomalies du Système Dentaire chez l'Homme et les Mammifères," Magitot, at page 72, says: "Some of our ancient authors mention cases of individuals who never had any teeth, and authors of modern times—though not exactly of recent date—likewise mention several cases of similar nature.*"

We do not consider those observations as trustworthy—unless, of course, we make an exception of cases of serious pathological diseases in the jaws which may have caused a total loss of the teeth or also of the permanent tooth-follicles

in young individuals. We have found recorded in the literature a certain number of cases of children who after serious diseases—such as the eruptive fevers—have suffered from necrosis, which in some instances caused the total loss of one or both jaws. Destruction of the bone may be followed by complete tissue reproduction, but if all the deciduous teeth are lost, and the follicles of the second dentition have been totally destroyed in the course of the necrosis, total absence of the permanent teeth must necessarily follow.

At one of the meetings of the "Société de Chirurgie," M. Quéniot presented an edentulous child in whom, after an attack of the measles, necrosis of the jaws had supervened. It is to be observed, however, that this case is interesting from a pathological point of view, not from a teratological one.

While the possibility of a congenital

* Borrel ("Hist. et obs. rar. cent." obs. 41), Dautz (*Arch. de Stark*, tome iv, p. 694), Fox, Magitot.

absence of several teeth or of atrophy of one or more primary follicles may be admitted, it is, on the other hand, difficult to conceive that all of the fifty-two follicles of the first and second dentitions should disappear through similar causes. It is to be observed that the fifty-two tooth-follicles relate to several dissimilar life-periods, and that the anomalies that

from the neighboring teeth, and by dental exostosis; these displacing the follicles, and eventually causing them to waste away entirely.

In Julius Scheff's work, "*Handbuch der Zahnheilkunde*," no case of total absence of the permanent teeth is mentioned, but on page 408 we find that three cases are cited, being credited to

FIG. 1.



may occur at any one period cannot consequently exert any influence on the others. It is for this reason that we would feel inclined to question the value of any report of cases of congenital total absence of the teeth, except when substantiated by a careful scientific investigation.

The pathologic causes of complete absence of the permanent teeth may be either traumatic—such as fractures of the jaws—or constitutional diseases such as rhachitis or syphilis; also destructive inflammation of the maxillæ (osteomyelitis) or in the tooth-follicles, or degenerative processes in the follicles—as, for instance, follicular tooth-cysts. The denture may be completely destroyed by tumors—i.e. sarcomas and cysts—arising

Fricke of Lüneburg, in which the deciduous teeth persisted until the ages of sixteen, eighteen, and twenty years respectively, when upon their being shed the permanent teeth erupted—thus showing that their appearing had been prevented, owing to the presence of the first teeth in the jaws.

Trueswell speaks of a case (Baumé's "*Lehrbuch der Zahnheilkunde*," page 68, 1877) according to which a man fifty-four years of age is said to have had all his deciduous teeth.

Wedel writes (in his "*Pathologie der Zähne*," 1870, page 76) that cases of total absence of the permanent teeth are very rare.

Linderer ("*Zahnheilkunde*," page 137) knew a lady sixty years of age who had

never erupted any teeth. A careful examination of her mouth absolutely confirmed her statement.

J. Tomes has given a description of one or two cases of the same kind; but in his own practice never met with

F. Carabelli ("Anatomie des Mundes," page 127) had never met with such a case, and was of the opinion that while the total absence of permanent teeth is a possible phenomenon, it is by no means a probable one.

FIG. 2.



any individual who from the beginning was destitute of all the permanent teeth.

S. H. Guilford (DENTAL COSMOS, vol. xxv, page 113) describes a case of total absence of the permanent teeth, but the patient was not examined by means of the Roentgen rays, as this case antedates the discovery of radiography.

G. Port, Heidelberg (*Correspondenzblatt für Zahnheilkunde*, 1902, page 197) reports a case of so-called congenital absence of the permanent dentition, but as the jaw was only partially radiographed, and as in addition it supported three deciduous teeth, it did not fully demonstrate the conditions as reported by the author.

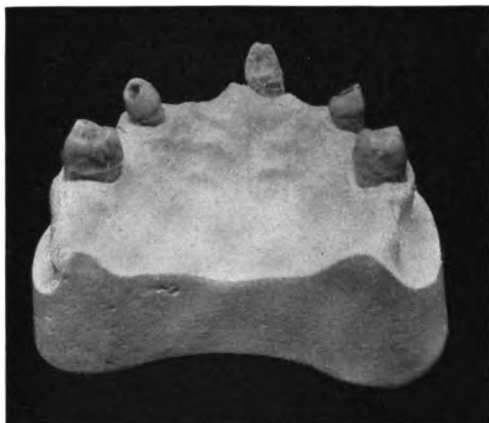
THE WRITER'S PATIENT.

On November 28, 1906, Mr. N., twenty-five years of age, called at my clinic in order to have complete upper and lower dentures made, declaring that he had never erupted any of his permanent teeth. The deciduous teeth had developed somewhat defectively. When a boy he lost the lower deciduous teeth, each tooth becoming loose, and gradually looser, until it fell out. The same process

angle was about 90° . (Fig. 1.)* The upper alveolar process was reduced to a small ridge; nowhere was exostosis or similar evidence of a formerly existing inflammation to be detected.

Before obtaining the radiograph (Fig. 2) a plaster cast was taken of the lower and upper jaws, in which only the deciduous teeth that remained are to be seen; these teeth were afterward extracted and carefully inserted in the plaster cast. (See Fig. 3.)

FIG. 3.



occurred in the maxilla, but not to such a marked degree, for at the age of fourteen he still had a few left, and at the examination five deciduous teeth were found. Their shapes could easily be distinguished from those of the permanent ones, on account of the former being worn down and presenting a dull appearance, being tiny in size, with a bluish tinge, and with less translucence than the permanent ones. The gums had greatly receded, but otherwise the mucous membrane was normal. The teeth were extracted, and the roots were found to be partly resorbed. The upper and lower jaws were senile in appearance; the alveolar process in both jaws was completely atrophied, but the mandibular

The profile view of the patient shows very distinctly that the lower teeth occlude far out beyond the upper ones; the mandible protrudes considerably, and during mastication the patient gives the impression of being an old man, instead of a man at the most vigorous period of life. (See Fig. 4.)

The patient said that he weighed about eight pounds at birth, and that he had been born without finger- or toe-nails. His mother is said to have been quite well during the whole period of gestation; she was delivered normally, and

* For the illustrations we are indebted to Dr. Kuhn Faber, director of the Roentgen clinic at the Royal Frederick Hospital.

suffered from no post-partum accident. She has never had abortions or stillbirths, and both parents declare that neither of them was ever afflicted with disease of a malignant nature, such as syphilis or tuberculosis.

During infancy the patient was very tiny and anemic; although slow of development he was otherwise healthy. He had been of a somewhat reserved dispo-

sition, and had had the measles and whooping-cough at the age of two years and diphtheria at the age of eight. The three attacks of illness ended in recovery without complications. As to destructive diseases of the jaws he could not give any information. As the anamnesis covering the period of the patient's infancy includes the measles only, and as the attack from which he suffered had run a normal course, the probable cause of the complete absence of the permanent teeth must be attributed to a developmental disturbance of some kind during the fetal period, although which particular one it as yet remains impossible to determine. As the patient's family history does not include another similar case,

the influence of heredity must be entirely excluded.

As mentioned above, Magitot also will not admit the possibility of all the permanent teeth failing to appear in the absence of a definite pathologic cause during intra-uterine life or after birth, unless and until a case of the kind has been conclusively proved by proper scientific investigation.

FIG. 4.



FIG. 5.



sition, and had had the measles and whooping-cough at the age of two years and diphtheria at the age of eight. The three attacks of illness ended in recovery without complications. As to destructive diseases of the jaws he could not give any information. As the anamnesis covering the period of the patient's infancy includes the measles only, and as the attack from which he suffered had run a normal course, the probable cause of the complete absence of the permanent teeth must be attributed to a developmental disturbance of some kind during the fetal period, although which particular one it as yet remains impossible to determine. As the patient's family history does not include another similar case,

In the case here reported by the writer the X-ray has clearly proved (see Fig. 2) that neither the germs of the permanent teeth nor the teeth themselves were to be found in the jaws.

The remarkable improvement in the patient's appearance after the insertion of upper and lower artificial dentures is clearly shown in Fig. 5.

It must be admitted that the requirements of investigation so strictly adhered to by Magitot have not been completely carried out in this case, but, as will be seen from the above, it was impossible to institute a more careful inquiry concerning the etiology of the case under consideration.

SURGICAL TREATMENT OF A DEFORMED MAXILLA.

By Dr. W. S. DAVENPORT, Paris, France.

(Read at a meeting of the American Dental Club of Paris, held in March 1906.)

FIG. 1, A, shows in the facial expression the mouth of a girl sixteen years of age, the subject of the case of maxillary protrusion to be described.

The four upper front teeth had been cut off by a former dentist, and replaced by artificial ones supported on a plate. Nearly all of the teeth above, and the posterior teeth below, were in a deplorable state of decay. The upper teeth were so prominent and elongated to such an extent that it was impossible for the lips to conceal the teeth and purple gums, even when the jaws were at rest.

It having been decided that any orthodontia procedure that might be resorted to would be insufficient to bring about the

necessary changes, a surgical intervention was resorted to in the following manner:

FIG. 1.



A B C

FIG. 3.



Cocain in one per cent. solution was injected freely, and all the tissues of the

FIG. 2.



anterior portion of the mouth (Fig. 1, A) were resected in the direction of the dotted line shown in the lower cast in Fig. 2. All of the upper teeth were extracted except the canines and second molars, which were cut down in order to lower the bite. The bones between the teeth and outer plate, as well as the gums, were cut away to such an extent that the patient in smiling did not show the gums. (See Fig. 1, B.)

Nearly all of the inner plate and the gums in that region were left intact; also that part of the canine roots above the smiling line. The roots were retained to preserve the necessary contour of the face, and were protected with gold.

The teeth were replaced with a simple suction gold plate. (Fig. 3.)

Fig. 1 at A shows the facial expression before the operation, and at B and C afterward.

APPENDIX TO ARTICLE ON "FACIAL INHARMONIES."

By ALFRED P. ROGERS, D.D.S., Boston, Mass.

IT is to be remembered that in undertaking the practice of orthodontia our ideals must be pursued with continued and painstaking effort. Even then it is quite true that we often fail to approximate what has been set before us as a standard; but these failures need not discourage us, because they are often due to some untoward condition which in years to come may be easily avoided by public or professional education. On the other hand, we not infrequently reach the ideal and secure beautiful and permanent results, not alone in relation to type, but in occlusion as well.

However, in recognizing that the pitfalls and dangers in our practice are many, it is essential that we strive in every way in order that our knowledge may be clear, broad, and well defined. Therefore, it seems that the study of type must occupy much of our attention, as it undoubtedly has an intimate relationship with our work and should be clearly comprehended. In fact, the more we study it the more clearly are we directed toward the idea that early treatment of malocclusion is an essential desideratum.

An idea which has been prevalent, but which is fortunately disappearing, is that all faces which come under our

treatment should be made to conform to given lines—notably of the Greek type. A very superficial study will soon convince one of the folly of trying to conform to this rule, because we know that there are many types of faces, and that the Greek is but one of them. More especially here in America, where we have no uniformity of type because of the intermingling of races, it is seldom that we see a purely Roman or Greek profile. With us they are more often found in combination. Therefore, in the correction of malocclusion of the teeth and the re-establishment of harmonious facial lines it is necessary to bear in mind the particular type to which the individual may belong. Figs. 1 and 2 represent the Greek and Roman, while Figs. 3 and 4 represent true American types—true because of the fact that normal occlusion is present in each case.

It is to be regretted that I cannot show a large collection of types, but in my search for the ideal I have been unfortunate in not being able to find true types of various nationalities on account of the prevalence of malocclusion, which is very frequently due to the loss of permanent teeth by extraction.

After considering this question. I

* The article printed at page 850 of the August issue of the *Cosmos*.

think it will be agreed that it is not the office of the orthodontist to endeavor to conform the faces which come under

do with the size and shape of the dental arches and the contour of the facial bones.

FIG. 1.



Augustus.

FIG. 2.



HEAD OF EROS (CUPID), (Vatican Museum.)

his influence to any given type, but that his mission is that of restoration of the face to its original outlines.

In all true types of faces the mesio-distal relation of the arches must be characteristic of the type of face under

DISTINCTIVE ABNORMAL TYPES.

Hitherto we have been considering the normal; but there are fast appearing among us types which we may consider abnormal, and with which we are more directly concerned. These types are the product of disease, heredity, accident, and environment, and in each case occlusion is imperfect. In some localities these ab-

FIG. 3.



FIG. 4.



treatment, and in our search for racial or national types this fact must not be overlooked. All types carry with them certain general characteristics, and are in turn modified by what we may term the temperamental types, which have to

normal variations have become so frequent that an artist in representing types of American faces unwittingly produced a number of profiles exactly characteristic of those suffering from distal occlusion. This incident goes to show very

clearly that among certain classes of our population distinctive abnormal types are fast appearing. These types are very

a higher plane in the results of treatment, I would suggest that fundamentally the non-extractionist is correct, and

FIG. 5.



often found to be due to the extraction of teeth—particularly the lower first molars—and also to some forms of malocclusion.

The dentist has indeed an important task before him, and in order that types the strongest and most beautiful shall

that if all cases were undertaken early enough, and properly treated, we would hear no suggestion of large teeth and

FIG. 7.

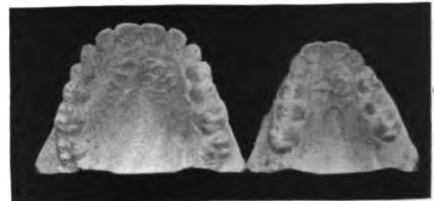


FIG. 6.



small jaws. I may also suggest to them that they seek the causes of non-develop-

FIG. 8.



be preserved it is necessary that the extraction of teeth shall be done away with, and that the dental arches shall be made to harmonize in size, shape, and mesiodistal relation, and that this shall be done at the period at which the facial bones may be molded to their proper contour. To those whose tenacity to old methods prompts them to be critical of the views of those who today seek

ment of the facial bones before settling down to the opinion that such conditions are pre-natal, and that Nature somehow or other has erred; reminding them also

that it is during the early period, when the arches are increased in shape and size, that the facial bones are developed.

Our ideals of beauty may vary, and we must bear in mind the fact that, with

hoped will be speedily overcome by education, is postponement of treatment until the bony development is almost or quite complete. The stimulated growth which takes place after and during treatment

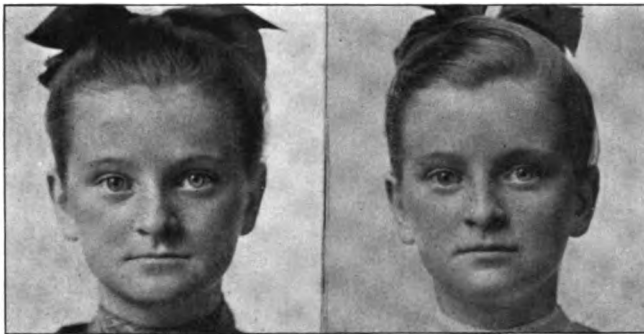
FIG. 9.



certain exceptional forms, Nature, unhampered, produces types uniformly beautiful, strong, or desirable. It is only in the presence of abnormal forces that these types become distorted and

of these cases is not always sufficient to make up for the lost years, and the re-establishment of correct type is made impossible, because in order to produce a type to which a particular individual

FIG. 10.



misshapen. It is therefore to my mind quite correct to assert that the extraction of teeth means the destruction of type, and it is a huge responsibility for any man to set his standard of beauty against the "adjusted harmony of creation."

In the production of the ideal, one of the handicaps, which it is confidently

may belong, it is not only necessary to place the teeth in normal relation, but also to induce the proper degree of bony development that will produce a suitable facial contour. This one conclusive fact explains some of our failures from an esthetic standpoint.

Now, the only remedy lies in the early

recognition of malocclusion and its timely and correct treatment. It is useless for the orthodontist to expect to produce regular lines in all subjects. He must be content with the salvation of in-

be understood to mean complete regularity. Harmony means balance, and must not be taken to mean conformity to the face of an Apollo or any artistic ideal. Any influence during childhood which

FIG. 11.



FIG. 12.



FIG. 13.



FIG. 14.

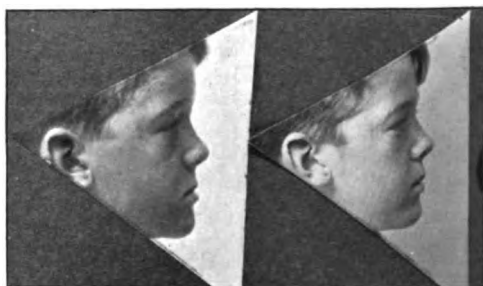
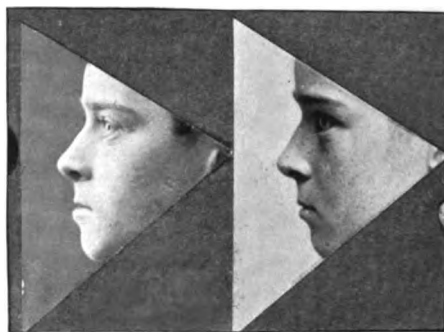


FIG. 15



dividual characteristics. These may not be beautiful, but they may be strong and desirable. All we should seek is the correction of the abnormal and the preservation of the type.

WHAT "HARMONY" IMPLIES.

We often speak of harmony in the facial lines, but by this we should not

produces malocclusion of the teeth must also result in the destruction of type, not alone because of the malocclusion, but also because of the under-development of the facial bones. These influences must be carefully guarded against, and when manifest should be corrected at the earliest possible age, in order that normal development may not be in the least interfered with.

Fig. 5 is given merely for the purpose of study, and shows very clearly the marked difference a very slight mesial or distal movement of the mandible produces upon the facial lines. The central figure represents an artistic ideal, while that upon the left shows a variation by the shortening of the mandible one line; and that upon the right, a lengthening of the mandible by one line. In other respects the three heads are identical, and with this slight change each presents a marked difference from the original. This idea is to show that but slight variation is required to produce a marked change in the appearance of the entire face.

In Fig. 6 we are shown inharmony in the facial lines and contour of a very young child, brought about by malocclusion of the deciduous teeth and lack of development during that all-important period of growth, being directly in consequence of the appearance of adenoid growths at the age of two years. I take this opportunity to emphasize the necessity for early removal of any nasal obstruction, because it is undoubtedly true that as the result of its presence the development of the face is retarded, malocclusion being in consequence made inevitable, and the facial lines of the child becoming distorted and misshapen.

In Fig. 7 we see normal development of a deciduous denture taking place. In this case normal breathing was always present, and the normal development of

the anterior segment of the upper arch is easily discerned. This figure represents a case of a child six years of age, and the interstitial growth is manifest by the separation of the six anterior teeth. While in this figure the beginning of the interstitial growth is represented, at the present time it is much more noticeable.

In Fig. 8 is represented a case of development of the upper arch which cannot fail to impress one with the enormous amount of growth which must have taken place in the facial bones as a direct consequence of this operation. It will be interesting to know that at a point one-half inch from the gingival border of the first bicuspid the vault of the original model measured 0.25 inch. Measurements taken at the same point after the operation showed a measurement of over 0.70 inch, proving beyond all question that in the widening of the arch the teeth were not tipped, and the apices did not remain in their former position, but were carried far beyond by the influence of increased bony development and the action of the inclined planes. The facial development accompanying this expansion is very unusual, and I regret that it is not my privilege at this time to show it to you.

The remaining figures will give an opportunity for the study of improvement in facial lines and restoration of type which have taken place after the establishment of occlusion accompanied by increased bony development.

OUR OLD STAND-BYS.

By Dr. EDWIN WHITFORD, Westerly, R. I.

(Read before the Connecticut State Dental Association at its annual meeting,
held at New London, Conn., April 16, 1907.)

WE all know what an amalgam filling is—or what it should be. We must know the uses of cement in combination with amalgam, and very probably all of us, by employing the latter, have restored teeth to their normal occlusion and usefulness. Inasmuch as the few ideas expressed in this paper are along this line, I cannot claim that they are absolutely new, although I believe I carry the idea of restoration somewhat farther than usual; and as I found out the method for myself, I call it new.

Let us take for our example a badly broken-down molar, with the crown and walls nearly or quite gone. If we are inspired with an ethical suggestion, it is to restore such a tooth to its natural usefulness. How? And here arise two conflicting ideas—as to whether it shall be a gold crown or an entire restoration by filling. Perhaps the gold crown is suggested by the patient under the impression that it will wear well, and the dentist may second the idea because it will please the patient; perhaps there is a feeling of security on the part of both dentist and patient that the work will endure because the carious crown will be entirely covered up—and right here I wish to say that I should prefer to call it buried, for only too often the crown becomes a sepulcher.

On a tooth which is broken down to the gingival margin, a gold crown cannot be placed to stay without either gingivitis, pericementitis, or death to the pulp resulting therefrom. That is not permanence.

Suppose it is a doubtful tooth so far as the health of the pulp is concerned. You cannot consistently test it for a gold crown, for many times a pulp that will

thrive under certain filling materials will die under a gold crown, because it is *buried* and *ought* to be dead. I have known of cases where, as a precaution against this possibility, a tooth has been devitalized. Against this practice I must enter my protest.

Enough for the golden sepulcher! What shall be done? Build the crown up. How? An inlay? Perhaps, but, gentlemen, if I were obliged to speak on inlays I should not be here, for there are too many of our learned brothers who have forgotten more than I shall ever know upon that subject. Remember also that this may be a tooth without a wall, and from my unlightened position it occurs to me that there is always a line of cement exposed in inlay work, which, if we try to avoid, results in more or less inaccuracy and guesswork.

I am aware that quite a number of dentists would stake their reputation on the porcelain and gold inlay. Doubtless they have the best of reasons for their opinion, and I admit that in certain cases the inlay will answer the purpose admirably. From an esthetic point of view a porcelain inlay, perfect in its color, is often indicated for anterior teeth, even if it must be replaced within six months. but for molars—and, in cases where they are not exposed to view, bicuspid—which are to be restored permanently, I employ that which, for want of a better name, I call an amalgam crown. We have all seen, and perhaps all of us have removed, a splash of amalgam from the cavity of a tooth, made to stay in position by some most barbarous pits and undercuts, with caries as the ever-present and accompanying feature. To such a use of amalgam we are unanimously opposed.

If the tooth be sensitive, the vitality of the pulp is first thoroughly tested. If the pulp be infected, I treat it or devitalize it, although if the pulp be nearly exposed but covered with healthful dentin, I cover the floor with a non-irritating lining of cement. In order to test the vitality of the pulp I insert a soft gutta-percha filling, and if the tooth remains comfortable for one or two weeks no fear need be entertained of subsequent difficulties arising.

After removing all imperfect tooth-structure I use a small stone or disk to bevel the walls toward the gingival margin. I then fit around the tooth a seamless copper band, such as that manufactured by the Ransom & Randolph Co. By annealing the band, and if necessary beating it out thin, it can be made to fit very tightly, and can easily be stretched to conform to the outline of the tooth. I usually fit the cap as far under the gum as a gold crown would be carried—at least half a line. I do so because I may in that way be sure that the band reaches below the cavity, thus insuring stability and exclusion of moisture. A mix of medium-setting amalgam is now prepared, which should be dry and crumbly when put in, except the first small piece or two, which may be softer. For covering the pulp a material of the nature of Iodoformagen cement should be given the preference, as the zinc oxyphosphate will more readily adhere.

The floor of the cavity and the inside of the walls—but not the beveled portion—are lined with a thin layer of quick-setting cement. I wish to emphasize these two points, because I notice that most failures in combination fillings arise from the use of too much cement. Gently press into the cavity the first particles of amalgam. If any cement exudes, wipe it away, and with it any excess of mercury. There is no need for hurry now, if the tooth can be kept dry. The cement lining is next covered and the pulp protected. Fill in with the already hardening amalgam on the bevel next to the band with considerable pressure, causing it to become united with the first amalgam, and fill to a full con-

tour. If convenient to both patient and operator, the band is removed the same day; if not, no harm can come from waiting. Be sure that the amalgam is thoroughly hard before removing the band, which may be done by use of a small stone or fissure bur. After removing the band polish off the excess at the beveled margin with small stones, disks, etc., burnishing toward the gum. Then polish with cuttlefish disks, inspect the occlusion and the interstitial spaces once more, and otherwise complete the operation.

I have restored many teeth in this manner—some after devitalization, some after covering the pulp, some after and some without testing the vitality of the pulp. I have practiced the method for nearly four years, and have never had a tooth die or an amalgam crown break or fall off; nor for any reason have I been asked or felt obliged to remove one, and, if I were, do not know how I should do it, for it is on to stay. This method is quicker than an inlay, less harassing to the patient, stronger, and surer.

In regard to pulp-preservation, while I do not believe in trying to preserve a naked or bleeding pulp, I know that a cavity can be excavated to almost a transparency over the pulp, and if that thin layer of dentin be normally healthful the pulp can be preserved by use of a proper covering. But as this is not a dissertation on so-called "pulp-capping" I prefer to leave this question to the discretion of the operator, although I am convinced that many pulps are devitalized uselessly because, in their close proximity, cement is looked upon as a destroying angel instead of a means of grace.

Perhaps much of what I have said is old to you, hence the first part of my remarks. I have heard descriptions of matrices in connection with nearly every kind of dental work, but, so far as I know, parts at least of this method are original with me; I have never seen it described before; but even if it be old—with apologies to you who may have been bored—if by its reiteration I succeed in affording to some of my *confrères* the satisfaction in its use that I have had, I shall be fully repaid for my efforts.

BURNISHED GOLD FILLINGS.

By G. M. GRISWOLD, M.D.S., Hartford, Conn.

(Read before the Connecticut State Dental Association, at its annual meeting, held at New London, Conn., April 16, 1907.)

IN this age, when so many are actively engaged in searching for new means and methods to accomplish more and better work, in our profession as in all others, we should ask ourselves repeatedly, as we take up work in any branch of our specialty, Is there any better way or method of making this, or performing that? All of us are liable to fall into ruts, and if we find that by following certain methods good results have been accomplished, we hesitate to set them aside unless we be thoroughly convinced that others are better. While such an attitude may be advisable, nevertheless we should be on the alert for "a better way," and this especially applies to the younger men in the profession.

Many of us are so constituted that although we may listen to the truths that are presented to us over and over again, they will have little or perhaps no effect upon us. This was the case in regard to the cohesive gold filling. Twenty years ago we placed amalgam on soft cement, used as a cavity lining, with good results, which practice has been followed more or less ever since. We have likewise tried at repeated periods to place gold foil in the same way, but with results not equally as satisfactory.

We had the pleasure of listening to Dr. Head of Philadelphia at the meeting of our society held in 1905 (see COSMOS, vol. xlvii, page 1322) and his paper contained thoughts that have led some of us to action. Since then I have tried many ways of placing gold in a cavity lined with soft cement, and possibly some of the points I have gained and which have been of benefit to me, may prove of some interest to you. If they shall lead any-

one who has not already done so to try the method, it will be a source of gratification to the writer, for he fully believes that the adhesive gold filling offers great advantages over the old method of inserting gold.

However, if the method be faulty or defective, we surely want to know it, and sincerely ask for a free discussion. Some of the points in favor of inserting a filling by this method are:

(1) We believe it to be a thoroughly tight filling, and one which better supports the walls of a cavity, in many cases lessening the need of "extension for prevention."

(2) It is a very firm filling, as it adheres to the walls as well as being retained mechanically.

(3) It is a very dense filling, as none but polished surfaces are used in condensing the gold.

(4) Its insertion is much easier for the patient, as the mallet is not necessary.

(5) It is much easier for the operator, as there is no chance for "rocking" and much less strain upon the eyes, as larger points can be used.

(6) It is a saver of time, although it requires thoroughness quite as much as does any other filling.

(7) It is more compatible with tooth-structure, causing less thermal irritation.

Before describing the technique of the method, let us state that in our opinion the secret of success lies wholly in the annealing of the gold and the proper application of the required degree of heat.

We do not give as much credit to the blued burnisher as do some, for although

a burnisher nicely blued and highly polished by a skilful instrument-maker is used with a great deal of satisfaction, a highly polished instrument not blued will accomplish the same results. But an electric annealer is a necessity for the best results. Let us quote from a little pamphlet issued by the S. S. White Dental Mfg. Co. on "Moss Fibre" Gold which is to the point: "Under no circumstances should the careful operator anneal this or any other form of gold in an open flame. That open-flame annealing has been and is now largely used, and that good, permanent operations have been and may be made with gold prepared by this method, is undeniable; but nevertheless such a practice is wrong. It is well ascertained that this same method of annealing has been responsible for many failures. It is unnecessary at the present day to go into detail, and show why the annealing of gold in an open flame is objectionable and unscientific; let it suffice that uniform annealing is practically impossible, and that a contaminated condition of the gold is liable to result."

Annealing upon a sheet of mica is much better than an open flame, but it is far from being equal to an electric annealer, as the gold is not continuously or evenly heated.

One of our best men—and one for whom the writer has great respect—stated that he "discarded the electric annealer because, when in use, if the annealer was jarred or shaken by accident or otherwise, so that the pieces would come in contact, they would adhere so tightly that they could hardly be separated and consequently caused much annoyance." It is true that if the pieces are in contact they will unite very firmly, but this only proves that the cohesive properties of the gold are brought out to a great degree, more so than by any other method tried, and we fully believe that our friend discarded the electric annealer for what is really its very best feature. The Custer annealer was the one chosen, as at the time of purchase it was recommended as the best. Others, however, may be just as good.

The method which follows of inserting an adhesive gold filling may not in many points, if any, depart from that given by others; however, we will give it in detail:

Prepare the cavity and its margins as your judgment may indicate, avoiding retaining pits and deep grooves made with an inverted cone bur. Make undercuts with round or oval burs, and as shallow as will be sufficient to retain the gold without the use of cement, experience having taught us not to depend wholly upon the adhesive property of the cement, although in many cases it would be sufficient. Select instruments with polished surfaces adapted to the size, shape, and location of the cavity. In starting the filling use as large a point as you conveniently can, and one adapted to the undercut of the cavity, for it will spread the gold more smoothly and there will be less of the "evening-up" process required later. Place the cylinders, rolled, or fiber gold, on the annealer; if the latter form be the one selected, cut or tear it in pieces of various sizes—none too large, however. Turn on the current and by the time the cement is mixed the gold will be thoroughly annealed. In selecting a cement for lining the cavity take one that is "sticky" when mixed sufficiently thin to flow quickly and smoothly over the floor and walls of the cavity. Out of quite a number tried, I have found Ames' quick-setting gray to be the most satisfactory for the size of the cavity to be filled. Mix the cement quickly but thoroughly, carrying it to the cavity before it really begins to set. A double-end bayonet-shaped amalgam instrument No. 2 of E. J. Ladmore's set is a good one for the majority of cavities, of course using the larger or smaller end according to the size of the particular cavity on hand. Do not use a steel spatula in mixing the cement, as it is very liable to leave a stain that will show through the enamel walls, especially if the walls be thin.

If you have succeeded in placing the cement quickly in the cavity, wait a few seconds until it begins to set; then carry the fiber gold to place, pressing it well into the groove, and if

necessary holding it with a fine point while more pieces are packed, in order that the attachment to the cement may not be disturbed or broken until the floor and walls of the cavity are well covered. Sometimes, after having covered the cavity with fiber gold, it is well to wait a few moments in order to allow the cement to harden thoroughly before continuing the filling, but usually the heat from the gold and burnisher hastens the setting sufficiently to prevent any delay.

After removing any overlapping cement, and making sure that the margins are free from it, the filling can be continued, using fiber gold or cylinders, or both. We have found it of advantage to use both, as the cohesive property of the fiber gold seems to be greater than that of the foil, and if for any reason the foil does not unite, by placing a piece of fiber gold cohesion will usually be re-established. After the first layer or two of fiber gold is inserted, cylinders or foil in any form are largely used, as they may be burnished to place more smoothly, and we believe more solidly, although in the "leveling up" process fiber gold spreads more readily, and is therefore of great advantage. We prefer foil, especially for the surface, but in many cases a few layers of rolled gold work

beautifully and produce a fine surface. In placing the pieces of gold press them gently to place before burnishing. This prevents dragging and displacing the gold before the attachment is made. Burnish each piece. This is of the greatest importance, as a dense filling cannot be made if several pieces are placed and burnished together. Trim and polish in the usual way.

In closing, I would say that we have used the method described almost wholly for the last two years; in fact, we have had occasion to use the mallet but little in that length of time, and in many cases only to test the density of certain fillings and to be more thoroughly convinced that we were producing a solid filling. We are realizing more and more the great relief it is to the patient to be freed from the blows of the mallet, and the consequent satisfaction to the operator. In the two years we have had opportunity to observe many of the fillings inserted by this method, and are more and more convinced that it is "a better way."

As we depend so largely upon the cohesive properties of gold in this method of filling, and as we make an adhesive filling by the use of the cement, it is suggested that we term it the "Co-ad" method of filling.

PULP-MUMMIFICATION.

By F. M. WILLIS, D.D.S., Ithaca, N. Y.

(Abstract of a paper read at the forty-fourth annual session of the Susquehanna Dental Association, Scranton, Pa., May 21, 1907.)

ALTHOUGH pulp-mummification has been before the profession for a number of years, it has not been adopted to any great extent—because, I think, of a lack of thorough understanding of the scientific nature of the operation, and a failure to realize the enormous advantages of the method, as well as the almost universal success which attends its careful execution.

I believe in and practice pressure anesthesia for pulp-removal, and recommend it for all straight-rooted teeth; but it has its limitations, and there are many cases in which it is not permissible. The operator who asserts that he removes every portion of a devitalized or anesthetized pulp in the bicuspid and molars either is self-deceived or fails to interpret conditions accurately. It is in those

teeth—bicuspid and molars—where it is a physical impossibility to clear to the end and carefully fill the root-canals, that the process of mummification is indicated.

The formula of the mummifying paste consists of two parts, a liquid and a powder.* The powder contains thymol, dried alum, zinc oxid, and iodoform—of each equal parts. The liquid contains glycerin 2 drams, formaldehyd 5 drops (20 per cent. solution). Mix a small quantity for each case, and have it as stiff as can be handled without crumbling.

First, be sure the pulp is alive. The nervousness of the patient may deceive us as to the condition of the pulp, and delude us into applying arsenic to one already dead or dying. Recently I uncovered a pulp and it bled what appeared to be arterial blood, but on closer examination I found that the pulp was devitalized and the bleeding was coming from a so-called "blind" abscess. It would have been a serious mistake to have applied arsenic to this tooth.

The presence of pulp-stones or secondary dentin complicates the treatment somewhat, and is a condition which requires great patience and careful judgment to conquer. All such deposits must be entirely removed before success can attend mummification.

Second, devitalize the pulp with freshly mixed arsenous acid, iodoform, and oil of cloves. A small portion of the arsenic will be absorbed by the pulp, and being one of the best preservatives known, renders the process of mummification easier. The iodoform acts as a local anesthetic and also prevents decomposition. The oil of cloves disguises the smell of the iodoform. I usually make an application to an exposed pulp and seal it with temporary stopping or cotton dipped in sandarac, and let it remain about a week, and sometimes longer; then drill it out a little, and if the pulp is not entirely de-

vitalized I make another application for a few days. Do not allow the patient's timidity to influence you to over-treat the pulp with arsenic, for if the arsenic should penetrate beyond the apex the tooth will be hopelessly affected. If there be any possibility of danger because of the arsenic coming in contact with the gum during treatment, first cover that portion of the gum immediately around the tooth with a pellet of cotton dipped in carbolic acid; then apply the arsenic to the pulp and seal the cavity as usual. Carelessness in using so powerful a remedy as arsenic may result in disastrous failure. It is never wise to apply it to an inflamed pulp. First reduce the inflammation, then the devitalization will be practically painless.

Third, drill out the bulbous portion of the pulp-chamber and a short distance into the larger roots, dry with warm air, and fill this chamber with the mummifying paste. Press it gently into place with cotton, flow a thin layer of quick-setting cement over the paste, and proceed with the permanent filling.

Caution: Never apply mummifying paste to a pulp that is not entirely devitalized, for otherwise there will be severe neuralgic pain for several days. Never apply mummifying paste to a pulp if the tooth is even slightly sore to the touch, but first treat the inflamed pulp with oil of cloves for a few days if found necessary.

Teeth affected by exostosis are not favorable cases for mummification.

A few words of explanation from the U. S. Dispensatory in regard to the drugs used in the mummifying paste will now be in order. Thymol is obtained by refrigerating the oil of several plants, especially of *thymus vulgaris*, thus causing it to crystallize. In composition it is analogous to creasote, carbolic acid, and salicylic acid. It unites with animal matter to prevent putrefaction.

Dried alum is obtained by heating alum until it is completely dehydrated. It is a white powder, without odor, and of sweetish taste. It is highly astringent.

Zinc oxid is obtained by the combustion of metallic zinc and is a white pow-

*[The mummifying paste suggested by Dr. Theodore Söderberg of Sydney, Australia (see *Cosmos* November 1895, page 922), consists of dried alum, thymol, glycerol, of each one dram; and zinc oxid, sufficient quantity to make a paste.—Ed.]

der without taste. It is astringent and exsiccant.

Iodoform is made by the action of potassium carbonate on a mixture of iodine, alcohol, and water. We have made it in the office by way of experiment. It is anesthetic in its action and prevents supuration. No less an authority than Dr. Robert Morris of New York asserts that pus will not form in the presence of iodoform.

Glycerin, which is made by the action of alkalis on fats and oils, is used on account of its preservative qualities and stable consistence.

Formaldehyd is made by the oxidation of methyl alcohol, and is one of the greatest preservatives known, being used extensively in embalming, an injection of one per cent. causing the body to harden without undergoing decomposition.

When these ingredients are mixed and applied to the remaining portion of a devitalized pulp, it causes the latter to become more or less hard, dry, and of fiddle-string consistence—in other words, it is mummified.

In some cases, after a few years the contents of the root-canal will become semi-fluid, without exercising any deleterious effect upon the tooth as a whole. If a tooth with a mummified pulp should be accidentally broken off in after-years, exposing the canals, these canals may be cleansed and filled without further treatment, the mummifying process having rendered them thoroughly aseptic.

The great advantages of the process are at once apparent. No extensive destruction of tooth-substance is required to gain access to the root-canals, and it is perfectly easy to operate through a small opening at right angles to the canals. The process is at least fifty per cent. easier to both patient and operator than is the usual attempt to remove the entire pulp and fill the canals. I seldom find it necessary to apply the rubber dam.

If mummification should fail in any case, the tooth need not be lost, for it would be perfectly feasible to change to the usual method of removing the contents of the canals and subsequently filling them.

I have used this process for nearly eight years, in more than three hundred cases, for patients in all conditions of health, varying in age from ten to sixty years, and have only a few partial failures to report, and these occurred during my early experience. In one case I had to extract a bicuspid after mummification, because I was careless during the preliminary treatment, the gum having been badly stung with arsenic. In two cases I applied the paste before the pulp was entirely devitalized, and had to remove the paste and repeat the operation. In another case there was considerable neuralgic pain in a lower third molar, which persisted for several days before I was able to control it.

In my judgment these unimportant failures do not militate against the process to any great extent.

I have an upper right second molar in my own mouth which was treated by mummification over a year ago, and it has been absolutely comfortable every minute of the time since.

Dr. N. L. Garling of Ithaca has used this method in twenty-five cases, with complete success in every case.

The proper treatment for pain appearing in a mummified pulp a day or two after the operation is to apply strong counter-irritants to the gums, and to administer ammoniac in ten-grain doses. In no case have I seen any tendency to abscess formation.

Pulp-mummification is not a transient vagary or an iridescent dream of an inventive mind searching for something new to present as a novelty at a dental convention; but rather it is a practical scientific method, worthy of adoption by every man who wants to do the best thing for his patient and himself. No process in dentistry requires finer judgment for its proper execution, and when scientifically performed it is absolutely definite and completely satisfactory.

It is not an easy scheme for the indolent or sloppy workman, but it is a rational method for the conservative, progressive man—who, in this simple manner can successfully solve one of the most difficult problems in dentistry.

I come not on this occasion to sing you a siren song, nor to lull you to sleep with the proclamation that the millennium in dentistry has arrived, but I come rather to stimulate you to more persistent study and earnest investigation along all lines

of our profession; so that with new discoveries, more skilful manipulation, more scientific methods, and more strenuous efforts, we may keep in the vanguard of the progress of the twentieth century.

HYGIENE MAINTAINED DURING THE PROGRESS OF ORTHODONTIA.

By H. CLAY FERRIS, D.D.S., Brooklyn, N. Y.

(Read before the Connecticut State Dental Association, at its annual meeting, held at New London, Conn., April 16, 1907.)

THE maintenance of hygiene of the oral cavity during the operation of regulating teeth is a problem that annoys the orthodontist, the usual method of cleansing the mouth by the vigorous use of the tooth-brush and powder being impracticable, as it frequently pulls the wires off and thereby interferes with the operation.

Our field of operation is one of low vitality, owing to perverted nature; nasal obstruction is present in a large percentage of the cases, rendering mouth-breathing a necessity and producing an abnormal development of the mucous tissue of the oral cavity and air-passages. The antiseptic qualities of the nasal mucoid secretions having been lost, the air passes through the mouth and enters the lungs laden with bacteria, owing to this abnormal action. The hypertrophy of the faucial and pharyngeal tonsils, usually present in cases of orthodontia, renders them more susceptible to the attacks of pathogenic bacteria.

The physical condition of these patients, owing to this abnormal functioning, renders their systems less able to resist attacks of bacteria such as the *diplococcus pneumoniae*, *bacillus diphtheriae*, etc. The accumulation of carbohydrates and proteid substances clinging to the metallic appliances, both

stationary and removable, forms the best food for the nourishment of oral bacteria; and these mucoid plaques are removed with difficulty, even by the most careful mechanical means. As in most mouths fermentation occurs after each meal, even in the absence of such appliances, in the event of their presence and on account of their accumulating tendencies the fermentative action is proportionately increased. The fermentation of carbohydrates results in the production of certain acids, among which lactic acid is the most important.

The decomposition of albuminoids results in the production of alkaline end-products. When the two are mixed with the products of fermentation they produce a mild acid reaction, which depends partly on the particular form of bacteria acting upon the mass and partly on the nature of the food and the percentage of its carbohydrate contents. According to the percentage of excess of lactic acid formed during the fermentative action of certain bacteria on the carbohydrates in the mouth, we find the pathological conditions of the mucous surfaces increased, as a hyperacid condition of the oral secretions proves to be one of the irritating causes of disease of these tissues by lowering their functional activity, and thereby rendering

them more vulnerable to any form of micro-organism.

Can we afford, in our effort to assist nature to establish a normal occlusion, to neglect hygienic precautions during an orthodontic treatment which places in the oral cavity materials which facilitate the accumulation and growth of these organisms, without endeavoring, with the assistance of the means at our command, to inhibit their reproduction? From bacteriological experiments we learn of the rapid growth of these bacteria in the oral cavity, and we find by clinical experience that the teeth and appliances are rapidly covered with oleaginous substances which become a favorable medium for their development.

The antiseptic qualities of the copper used in some orthodontic appliances we appreciate, but we know that the colloidal copper which exercises this antiseptic action is given off only while the metal is polished and free from albuminoid deposits. Consequently, when wires containing this metal are not submerged under the gum tissue, the antiseptic action is soon lost, and therefore we must look to other means for cleansing these surfaces.

Again, in the adjustment of wire ligatures, even in the most skilful hands, the operator is apt to puncture the mucous tissue, and as it may be assumed that these wires are—bacteriologically speaking—unclean, we are liable to infect the susceptible subject. We have but few such cases on record, one of which—reported by Dr. J. W. Russell to the Second District Dental Society of the State of New York—was of tuberculosis in its most virulent form, acquired through the use of a septic dental scaler, and which resulted in the death of the patient. The difficulty of tracing these infections to the hands of the dentist is the reason for the few reports of this character. Simple methods in technique can to a large extent control such infections.

If, on the contrary, we find that the wire furnished us by the dental supply houses is sterile, it is liable to become infected by handling. The wire put on the market by Dr. Edward H. Angell will

frequently give negative bacteriological results.

A bouillon tube was infected by a wire of this make and kept in an incubator in Seney Hospital under the care of Dr. Dexter, pathologist of the institution. Another tube, containing some of the same bouillon infected with serum from a septic wound, was introduced into the incubator at the same time as the former, and developed a culture in half the time. This single experiment does not prove that these wires are invariably sterile when they reach our hands, and as the method of sterilizing them is so simple, we should certainly assume no risk of subsequent infection.

By introducing a bundle of wires into a glass tube properly corked, we may sterilize the contents by boiling for twenty minutes in a saturated solution of sodium carbonate and allowing them to remain in the solution. They may also be sterilized by exposing them to the action of formaldehyd gas for eight hours; or by allowing them to remain in a colloidal copper solution for one hour; or by subjecting them to dry heat. By using any one of these methods we may be reasonably sure of having a sterile product. Each method has its advantages and disadvantages. The preference should be given to that of dry heat or formalin, as these do not tend to oxidize the appliances.

Our field of operation is the most septic of any in the body; therefore the first step in the technique should be to render it aseptic so far as is possible. We first, as thoroughly as possible, mechanically cleanse the teeth with a frictional material, and then spray the parts with antiseptic solutions under high pressure, in order to destroy the bacteria present. We have numerous antiseptic agents of varying value, from which we may select one sufficiently powerful to meet the case. The most cleanly patients naturally present the most healthy tissues; but their susceptibility to infection, owing to their general systemic condition, must be taken into consideration.

To prove the necessity for antiseptic treatment, a wire that had been worn.

three weeks was taken from a mouth which had received no prophylactic care. It was gently scraped with a sterile platinum loop, with which a bouillon culture tube was inoculated, the wire itself being placed in another bouillon tube. The latter developed no culture, thereby proving the antiseptic qualities of its composition, as the surface was enabled to give off colloidal copper. In the former, a microscopical slide showed the presence of bacilli, diplococci, and micrococci.

There are solutions that are largely alkaline and pleasant to the taste, with little antiseptic value; but the patient's sense of taste must not be considered to his detriment. The solutions which are sufficiently strong are not particularly pleasant, although this may partially be controlled with flavoring materials. There are two drugs, accepted by authorities, which we may employ. The first may be used on mild conditions, and consists of the following:

R—Tricresol, ℥ xxx;
Aque cinnamomi, ℥ iv. M.

Sig.—To be used in spray at the temperature of 115° F.

The active principle of this solution is the tricresol, the oil of cinnamon being used to disguise the disagreeable taste. The former is a clear, white, watery liquid, having three times the disinfecting value of carbolic acid, and being three times less poisonous and less caustic. It is composed of ortho-cresol thirty-five per cent., meta-cresol forty per cent., and para-cresol twenty-five per cent. In bacteriological experiments undertaken by Major Walter Reed, curator of the Army Medical Museum in Washington, it was found that a one per cent. solution of it accomplished as much as a four or five per cent. solution of carbolic acid. It is particularly valuable for our purpose, as it is active in fluids rich in albumin; and being of neutral reaction, leaves the metallic surfaces bright. It is also readily soluble in aqueous solutions.

In acute conditions, when we require

a stronger antiseptic, we may use the following solution:

R—Iodin, ℥ xix;
Potassii iodidi, ℥ xix;
Aque destillatæ ad q. s. ℥ iv. M.

Sig.—To be used in spray under high pressure at the temperature of 98° F.

The antiseptic value of iodine has been recognized for centuries, but the value of any antiseptic is in proportion to the strength in which it can be used. This agent, in its powdered form, as iodoform and aristol, is a standard in our hospitals. It has a quality which mercury bichlorid does not possess—that of producing the destruction of the capsule of a spore. It has been recently found that the solution of this drug becomes more potent when potassium iodid is combined with it, the latter agent increasing its solubility. The U. S. P. published in 1906 directs the addition of potassium iodid to all tinctures of this drug. The solution here recommended, when sprayed in the oral cavity, will fix and stain the plaques of bacteria so that they may be detected both upon the surfaces of the teeth and on the appliances. In order to remove these plaques use the following mixture:

R—Starch, gr. xxxviiij;
Aque menth. pip., ℥ iv;
Oil peppermint, ℥ xx.

Mix the first two ingredients and let stand for five minutes, then boil five minutes, and then add the flavoring.

This will convert the iodine into an iodid of starch, which is an insoluble compound which tends to cut mucoid substances, and when washed off in flocculent precipitate from the surfaces of the teeth and appliances, carries with it the proteid substances.

To decolorize the stain thus formed and wash off the precipitate employ the following solution:

R—Sodii carb., gr. xxxviiij;
Aque gaultheriæ, ℥ iv.
Olei gaultheriæ, ℥ xxx. M.

Sig.—To be used at the temperature of 115° F.

Chemically we have this reaction:
$$KI + 6I + 3Na_2CO_3 = KI + NaIO_3 + 5NaI + 3CO_2$$
, starch appearing on

both sides of the equation, and not entering into the chemical reaction. The first two solutions, the iodine and the starch, are united to form an iodide of starch, leaving the potassium iodide free; and as we find potassium present in our normal saliva, we assist nature by this means to dissolve the excess of mucin. After a treatment as here outlined we may be reasonably sure that we are working on a sterile tissue, and that the liability to infection in our patients is reduced to a minimum.

The hands should be sterilized by brushing with a sterile brush and green soap, subsequently immersing them in an antiseptic solution—preferably three per cent. camphenol—which should be placed in a bowl within reach of the operator, in order that he may free his hands of mucus during the work. The boiling of pliers, scissors, and carriers during the intervals between their use on patients is a precaution that no intelligent operator can neglect. Instruments such as lancets, scalpels, broaches, etc., may be placed in glass tubes and boiled for twenty minutes in a saturated solution of sodium carbonate, and placed in the cabinet ready for use at any time.

The prophylactic treatment at each visit, once a week, requires but ten minutes, and the results are remarkably sat-

isfactory. The patient is directed to be particularly careful in cleansing the mouth, and is given a solution as follows:

R—Hydronaphthol,
Menthol, āā gr. xxx;
Olei gaultheriæ,
Olei cassiæ, āā m iv;
Spts. vini rect., 3 x;
Tinct. capsici, 3 j;
Aquæ destillatæ ad q. s. 3 xx. M.

Sig.—Teaspoonful in a half-glass of hot water.

This is to be used twice daily, morning and night, and in acute conditions five times daily, holding the solution in the mouth for three minutes. A mouth thus cared for will show little, if any, inflammation even in the presence of irritation, and the operator may feel that he has done all in his power to protect his patient. A ligature wire which had been worn in the mouth for one week under this prophylactic treatment was placed in the incubator, and at the end of three days developed a negative result. While single experiments do not scientifically prove an hypothesis, your essayist offers this practice for your consideration.

I am indebted to Drs. T. H. Dexter, G. E. Hunt, T. W. Brophy, A. W. Harlan, and to Mr. H. L. Quick, Jr., for many of the facts used in the preparation of the paper.

PROCEEDINGS OF SOCIETIES.

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, New London, Conn., April 16 and 17, 1907.

THE forty-third annual convention of the Connecticut State Dental Association was held in the convention hall of the Mohican Hotel, New London, Conn., on Tuesday and Wednesday, April 16 and 17, 1907.

TUESDAY—Morning Session.

The first meeting was called to order on Tuesday morning at 10 o'clock by the president, Dr. A. W. Crosby of New London, Conn.

The first order of business was the reading of the minutes of the last session, which was on motion dispensed with, on account of their having appeared in the printed Transactions, a copy of which had been sent to each member of the society.

The president, Dr. A. W. Crosby, was then presented with a very beautifully engraved gavel, the gift of the members of the society, Dr. James McManus making the presentation address.

Dr. F. T. MURLESS, Jr. I wish to present in proper form the following proposed amendment to the by-laws of the society, which I presented last year, and which comes up for final action at this time:

RESOLVED, That the following become Article X of the by-laws of the Connecticut State Dental Association, that the present Article X be made Article XI, and succeeding articles be renumbered to correspond:

"No dentist or physician who is not a member in good standing in his own local or state society shall present either a paper or clinic before this association, or take active part in the proceedings."

The resolution was adopted.

Dr. G. O. McLEAN, Hartford, presented the following amendment to the by-laws for final action by the society, the amendment having been offered at the last meeting of the association:

RESOLVED, That Article IV, Section 1, shall be changed to read: "Active members shall sign the constitution and pay an admission fee of three dollars, and annual dues of three dollars in advance."

Dr. Adams moved, as an amendment to Dr. McLean's amendment, that this amendment to the by-laws take effect on and after the third Tuesday of April 1908.

The motion was carried.

The next order of business was the reading of his address by the president, Dr. A. W. CROSBY, New London, as follows:

PRESIDENT'S ADDRESS.

New London extends to the Connecticut State Dental Association a most hearty welcome on this occasion, its forty-third annual convention. Only once before has the state association met in New London. This society was then in its infancy. The meeting must have been a small one, as it was held in the office of Drs. Sheffield & Brown.

The Connecticut State Dental Association stands for progress. Perhaps in no better way can the contrast be shown between the dentistry of the olden days and that of the present time than by reading some of the advertisements which appeared in the early New London newspapers.

In the *Advocate and Republican* of 1841 appeared the following advertisement:

E. VINCENT, *Surgeon Dentist* from the City of New York, having taken an office at Westerly, R. I., near the Washington Bank, respectfully offers his services to the public. He will extract teeth or roots of teeth with the least possible pain or fracture of the jaw. Also Mr. Vincent will cure the toothache permanently without pain; and all dental operations will be performed in the best manner.

Another advertisement, appearing in the same paper the following year (1842), reads as follows:

J. WASHINGTON CLOWES, *Surgeon Dentist*, would respectfully inform the citizens of New London and the public generally that he has permanently located his office in Smith's Building, Court st., where he will perform the various operations pertaining to his profession, whether surgical or mechanical, in a manner perfectly satisfactory to all who may confide in his professional ability. Artificial teeth, from one to thirty-two, will be adapted to the mouth; fulfilling not only the purposes of ornament but performing in a complete and triumphant manner the process of mastication.

J. W. C. respectfully refers the public to the following highly approved recommendation:

"I hereby certify that I have known J. Washington Clowes for the past three years, and that during that time he has been with me as a dental student. Thus knowing him, I am able to bear full testimony, not only to his ability to perform well and truly all the duties of his profession, but likewise to his good moral character and punctuality in his engagements, and a close attention to business. I do, therefore, without any qualification or reserve, recommend him to the confidence of my friends and the public.

"J. SMITH DODGE, *Surgeon Dentist*,
 "Bond st., New York.
 "June 4, 1842."

This indorsement is interesting because it shows that the best men of the profession were at that time cognizant of principles upon which our present code of ethics is founded, although the reading of the advertisement, "fulfilling not only the purposes of ornament, but performing in a complete and triumphant manner the purposes of mastication," sounds quaint indeed.

If these advertisements have been of interest, you will also be interested in going back to a time twenty years earlier, when the following appeared in the *Republican Advocate*:

Utley's Remedy for the Toothache.
 This remedy was discovered about three years since (residing in a vegetable substance) by Col. Joseph Utley, of Hartford, Conn.

The following certificates of its efficacy from men of the first respectability, given by them through motives the most humane, are submitted to the perusal of the candid reader:

"Having long been afflicted by the toothache, and dreading to have my teeth extracted, I was induced about two years since to use Utley's Remedy for the toothache. It effected an *entire cure*, and I have had no return of toothache since. Being at that time in command of the state prison of Connecticut, I applied it to the prison guards under my command, and to a number of my neighbors, with uniform success. When properly applied I believe it to be an effectual remedy.

"CHAS. WASHBURN.
 "Hartford, May 1820."

"I have used Utley's Remedy for toothache in my family at various times for two years past, and most cheerfully recommend it as an effectual *prevention* of that malady.

"WARD WOODBRIDGE.
 "Hartford, May 1820."

"Three years ago I was much troubled with the toothache. I applied Utley's Remedy, and have not been afflicted with any pain of the teeth since.

"FREEMAN KILBOURN.
 "Hartford, May 1820."

Pleasant as it is to linger in the past, our time is so limited that we must forego that pleasure and proceed to the questions of the day.

The very able Legislative Committee of our society recently took upon its shoulders the task of strengthening our dental law. There were two or three noteworthy changes among the half-dozen recommended.

It was recommended that the governor appoint, before the first day of July 1907, five Dental Commissioners—one for five years, one for four years, one for three years, one for two years, and one for one year; and that annually thereafter, before the first day of July, one commissioner shall be appointed, who shall hold his said office for a term of five years from the first day of July next succeeding his appointment. These appointments were to be made from a list of names furnished the governor by the Connecticut State Dental Association.

Section 3 was strengthened by inserting the words: "In the manner provided by said commissioner," in place of the words "Pursuant to the laws in force at the time of their license or registration," thus legalizing the action of the commission requiring all who were in practice to have registered prior to December 1, 1892, and eliminating any ambiguity as to its interpretation.

Section 2 was stricken out, and the following substituted:

"All unlicensed assistants who, on January 1, 1907, were actually employed in per-

forming dental operations on patients in the office of a duly registered or licensed dentist, may register their names with the Dental Commission prior to October 1, 1907, upon the presentation of the affidavit of two registered or licensed dentists, stating the name and address of such applicant, and the length of time he or she have been so employed, in such form as the Dental Commission shall prescribe. Any person so registered as aforesaid may perform dental operations on patients in the office of a licensed or registered dentist, and under the immediate personal supervision of such registered or licensed dentists, but not otherwise.

"The provisions of this chapter shall not prevent a physician or surgeon, practicing as such, from the performance of any operation in dentistry on a patient under his charge, or a visiting clinician at a meeting of a regularly organized dental society from performing dental operations, nor an assistant of a registered or licensed dentist from performing the so-called operation of cleaning teeth."

Modern dentistry is a most comprehensive subject, and there are any number of topics to which I could invite the attention of the Connecticut State Dental Association, but there is one subject so new that it savors of radicalism; so new that it takes some courage to bring it before a convention in the year 1907, knowing full well the criticism and opposition which it will meet before it achieves that approval which it will surely win when the public become enlightened as to its importance.

The subject of which I wish to speak is "Examination of the Teeth of School Children." People are at first prone to say that public supervision of children's physical welfare smacks of paternalism, and parents bristle with resentment at this action *in loco parentis*. But further thought carries with it the conviction that the physical betterment of school children no more savors of paternalism than does their mental betterment. The Germans have a saying that "One hand washes the other," and in no way is this proverb more aptly applied than in the interrelation of sound mind to sound body.

The school teacher's task is universally acknowledged to be an arduous one, but

his—or more often her—labors would be manifestly lightened were all pupils bright and none stupid.

The examination of the eyes of school children, now so commonly enforced, has brought to the front bench pupils who on the back seat seemed stupid. Likewise the deaf pupils, after examination, given as it now is in many public schools throughout the country—these deaf boys and girls, I say, have been made to hear.

A busy teacher in the whirl of the modern curriculum is less apt to see a physical than a mental defect. The teacher should therefore be aided in improving the physical well-being of the pupils, if the boys and girls of today are to be what Wendell Phillips described them in 1824, on the occasion of Boston's reception to Lafayette. He said, "The city gave him the best it could afford, the sight of its school children."

Now, how shall we as dentists help to bring the school children to their highest physical efficiency, that the boys and girls of today may indeed be Connecticut's most distinguished possession?

We dentists are as truly our brothers' keepers as is the oculist or aurist, and it is as much our duty to enlighten the public upon the evil of an unclean mouth, of the very great evil of extraction, and of the disastrous effects of adenoids. There is less need to speak of carious teeth, their discomfort bringing its own remedy.

I am unable to learn of any state which fully looks after the physical welfare of its school children. Most of them have laws which look after contagious and infectious diseases. Connecticut has a law which requires the annual examination of the eyes of its school children: Massachusetts includes the ear. In New York city the Board of Health, under Dr. Darlington, is doing the finest work in the country for the care of its school children. The *modus operandi* is this: The child is examined by the school physician when it first presents itself at the school. If the physical condition is not up to the standard, the child is sent home, and

a post-card, with a paid reply attached, is sent to the parents or guardian, stating what the defect is and recommending that immediate attention be given by the family physician or dentist. If the family be too poor, the school physician will perform the service. The notice requests that the reply card be taken to the physician or dentist, who in turn mails it back with the blanks filled in, showing that the matter has received attention. If the case be neglected, the school nurse calls on the parent, explains the desirability and benefits of treatment, and urges that the case be immediately attended to. If the parent is unable to have it done, permission is procured to have the school physician do it.

Here is where a free dental clinic will be of inestimable value. Data is now being obtained for that purpose, and to show the need of the appointment of a dentist on the board of health. Dr. Herbert Wheeler and thirty other prominent dentists of New York city have formed an association to support the undertaking. This work is being carried on by a committee consisting of several physicians and a dentist, men interested in sociological work, Dr. Wheeler being the dental representative. They work under the Association for the Improvement of the Condition of the Poor.

A dental clinic has been established in the Fifty-third Street Industrial School, and has the financial support of the Children's Aid Society. The teeth of the children in this school are not only examined, but inflamed gums and putrescent pulps are treated, teeth filled, and when necessary, teeth are extracted. The fillings are plastic only. Statistics already obtained by the committees show that seventy-six per cent. of the children have never been to a dentist.

Dr. G. H. Cronin of the board of health, said, in a recent address, that 30,000 out of the 300,000 school children in Manhattan were backward. They proved on inspection to be unable to see distinctly, to hear properly, to breathe well

—on account of growths in the throat, or to be suffering from some defect. Dr. ——— of the same board said that twelve per cent. of the pupils suffer from adenoid growths, and so are mouth-breathers. This defect is easily corrected by a comparatively painless operation, and the pupil is usually back in school in from twenty-four to forty-eight hours. In five or six weeks the little patient is changed from a stunted, stupid, putty-faced, lackadaisical child, who can keep its mind concentrated on one thing but for a few moments at a time, into a rosy-cheeked, bright-eyed child, who is able to keep up with his class and is tractable in disposition.

"A child suffering from any of the ailments mentioned, misunderstood by the teacher—who most frequently supposes it to be stupid—and ignored by the unenlightened parents, conduces to illiteracy, to complete nervous breakdown, and finally to insanity."

In New Jersey a committee of twenty dentists, appointed by the state society, have succeeded in a number of places in securing permission to examine the teeth of the school children. Duplicate charts are made out, one being left with the principal of the school; the other is sent to the parent, if dental services are required, suggesting that the child be taken to the family dentist to have the necessary work done.

Dr. Means, president of the school board of Cincinnati, Ohio, was convinced that the reason most of the backward—and even incorrigible—children did not do better, was because they were suffering from some physical defect which was remediable; that these children were ill, and more to be pitied than driven. Many of them were told by their teachers that if they did not do better they would fail to pass to the next grade. They became discouraged and thought they were not as bright as were other pupils; some of them became truants, fell in with the "gangs"; from that into petty thieving, and finally became confirmed criminals. He contended that it was more economical, and money better spent, to examine the children and correct these defects,

than to build great penal institutions. If these children did not all turn out brilliant after treatment, they would, at least, grow up self-supporting and respectable citizens.

About five hundred who were incorrigible, who were doing poor work or who failed to pass the successive grades, were examined, and ninety-five per cent. were found to have some defect of the eye, ear, throat, or nose. The percentage in New York city proved the same on a similar examination. Unfortunately, Dr. Means does not seem to have thought to get statistics on the disorders caused by not being able to properly masticate food—either because of carious and diseased conditions or malocclusion of the teeth. Nor does he take into account the pernicious effect, on the digestion, of a filthy and germful mouth.

In Strasburg, Germany, in the public schools, out of 12,691 pupils whose teeth were examined, 7065 had teeth extracted.

I am not advocating the "odontocide," but proper treatment of the teeth results in speedy banishment of such unpleasant afflictions as headache, earache, toothache, and even that bane of adolescence—stomach-ache.

Examination of the teeth of school children in Hochheide, Germany, is very suggestive. Only 35 out of 1020 children had sound sets of teeth. In 396 children, poor physical condition was attributed to poor teeth.

In this state there are signs of an awakening. In Hartford a committee from the Hartford Dental Society met with favor when they presented the subject of examination of the teeth of the children in the public schools before the board of health.

In New Haven Dr. F. W. Brown, in his examination of the teeth of children in four of its public schools, under the direction of the Mothers' Club, found that seventy-five per cent. of the children needed the services of a dentist.

In New London the matter is about to be presented to the school board. This leads us up to the necessity of establishing free dental clinics in the several cities of the state.

New Haven, I believe, has the only one at present, but if the teeth are to be examined, and the necessity shown for the care of the teeth as an important factor in the health of an individual, some provision ought to be made whereby the teeth of the poor children could be cared for until such a time as they are self-supporting.

In fine, I recommend that in each locality steps be taken with either the school board or board of health to have the teeth of the children in its school examined twice annually. Where there are local dental societies this should be done under their direction; and where there are none, under the individual direction of members of the state society free dental clinics should be established wherever possible, and carious and putrescent conditions of the teeth, with diseased conditions of the mouth and gums, be treated, and the teeth cleaned.

Far more attention should be paid than now to children suffering from adenoids, with the attending effects of chronic catarrh, crowded teeth, deformity of the chest, and deficient oxygenation of the blood.

Physical betterment is already recognized as a financial asset. It has been said that an increase of five per cent. in the economic value of working men in Germany, under fifty years of age, would pay for the standing army. In England, many men who have had army training are paid twenty-five per cent. more than current wages in their trades.

In business and professional life today intense competition taxes the energies to an ever-increasing strain. Therefore bodily activity, dexterity, presence of mind, and endurance to fatigue go far toward compensating defects in education. As though it were necessary to further emphasize what none need telling, I will quote what one vigorous modern thinker, the Rev. Percy S. Grant, said recently in an article in the *North American Review*, on Physical Deterioration of the Poor: "Health is the best mentor; a sick, devitalized man is restlessly driven to all sorts of substitutes for strength—to drink, to pleasure,

to passion—in fact, to any excitement that momentarily excites his energies. Health has no need of narcotics, and will hold a man to a reasonable manner of life.”

I will close by adding from that book, so true that it seems ever new, Herbert Spencer's "Education": "Perhaps nothing will so hasten the day when body and mind will both be adequately cared for as a diffusion of the belief that the preservation of health is a duty. Few seem conscious that there is such a thing as physical morality. Men's habitual words and acts imply the idea that they are at liberty to treat their bodies as they please. Disorders entailed by disobedience to nature's dictates they regard simply as grievances, not as the effects of conduct more or less flagitious. Though the evil consequences inflicted on their dependents and on future generations are often as great as those caused by crime, yet they do not think themselves in any degree criminal. It is true that in the case of drunkenness, the viciousness of a purely bodily transgression is recognized, but none appear to infer that if this bodily transgression is vicious, so, too, is every bodily transgression. The fact is that all breaches of the laws of health are physical sins. When this is generally seen, then, and perhaps not till then, will the physical training of the young receive all the attention it deserves."

Motion was then made and carried to adjourn until two o'clock.

Afternoon Session.

The afternoon session was called to order by Dr. F. T. Murlless, Jr., chairman of the Executive Committee.

The first order of business was the discussion of the President's address, postponed from the morning session.

Discussion.

Dr. JAMES McMANUS, Hartford. I would like to say a few complimentary words regarding the President's address, but what I want particularly to say is in

commendation of his remarks on the question of the examination of the teeth of school children. In addition to this, I want to say what probably but a few of you know, that Hartford stands first—I think even ahead of New York in a certain way—in the matter of doing something, having the sanction of the city officials, with regard to the examination of the teeth of school children. For some two years we have had a dentist on the school board and a dentist on the health board, and they, together with the committee of the Hartford Dental Society, have worked in such a way that there is every reason to expect that this autumn there will be something done, definitely and officially, in the way of the examination of school children's teeth, in order that the teachers of the public schools should instruct the children in mouth-cleanliness and the care of the teeth. I think Hartford dentists have a right to be proud of the fact that their efforts have the official support of the city, and whatever they attempt will be done, I think, thoroughly.

The reading of the report of the movement in New York was very interesting. I saw what was probably a synopsis of that same report—which the president gives us more fully—in one of the New York papers several Sundays ago, in which I was very much interested, and which shows that they also are doing good work. But whether or not it is being done officially I do not know, and I could not quite catch that point in the address—that is, whether this was an official action or whether it was the independent action of certain men in the profession to forward the movement.

I have always claimed that if we have the right to send examiners into the schools for the purpose of examining the eyes, for the purpose of vaccinating the children, or for any other purpose, we should have as much right to insist that the mouths of the children be examined and the pupils given instruction as to the manner of properly caring for their teeth.

Dr. A. H. SPICER, Westerly, R. I. One of the most interesting addresses we have

had for years is the one to which we have listened today. Dr. Crosby has given us some very important historical data with regard to dentists in the old days. I wish to say with regard to Dr. Vincent, who located in Westerly, that I am the proud possessor of the turn-keys with which he turned out teeth painlessly.

Dr. F. W. BROWN, New Haven. The portion of the address that interested me most was in reference to dental education in the schools, something I have been interested in for the last two or three years. I started in that line of work by reading a paper upon the care of the teeth before the New Haven Mothers' Club, and since then I have drifted into reading papers before the different public schools. A number of schools have what they call parents' afternoon, which the parents of the school children are invited to attend, and at these gatherings different professional men are invited to read papers. Upon such an occasion I was asked to read a paper on the care of the teeth, which I did, and I was very much surprised at the interest manifested by the parents. I also found the children becoming interested in the anatomy and care of the teeth.

After reading the paper I started in to examine the teeth of the children, and found that quite seventy-five per cent. had never had any dental care. This was a most deplorable condition; it seemed to me that the parents had neglected taking care of their children's teeth. A large majority of the parents seem to think that treatment and general care are useless in the case of the first teeth, because in any event they must soon be lost. When it was shown to them in the proper light—that the child cannot masticate properly unless he has good teeth, and also the reasons why the deciduous teeth should be retained until the time for the eruption of the permanent ones—it seemed to awaken a new interest in their minds. At the last school in which I made examinations, I think there were about fifty parents present. The examination of the children was not compulsory, but when I finished

that afternoon I think I had examined about all the children's teeth in the school. This is a subject in which the children and teachers are very easily interested, and I am glad to see that Dr. Crosby has started a movement in the right direction. It seems to me that going into the schools and instructing the children in the care of their teeth will be of great benefit to them.

With regard to the suggestion of having a dispensary, while we have one in New Haven, I find it a very difficult matter to induce the better class of poor people to go there, on account of the objectionable foreign element that demands treatment at the institution. Almost the first question they will ask you is, What class of people do you have there? I hope the local societies will take up this matter, and that the dentists will go into the schools and educate the children in the care of their teeth, and that good results will spring from what Dr. Crosby has said today.

Dr. E. WHITFORD, Westerly, R. I. I regret very much not having heard the paper, but the remarks of the last speaker have given me the opportunity for which I have long looked, that of saying something in regard to the attitude of parents toward the teeth of children. I was asked some time ago to address a mothers' circle on this subject, and during a talk, of say one hour and a quarter, I had an apparently very much interested audience. I was astonished, however, to learn that the most simple ideas—and I gave nothing but common-sense ideas—about the care of the teeth were revelations to the mothers present. One lady, who is well respected and highly educated, seemed very much surprised at some of the ideas suggested, and asked me the question, "Do you mean to say that children's first teeth ought to be cared for until the second teeth come?"

The speaker who preceded me said that seventy-five per cent. of the children's teeth were not cared for. I think I could go farther than that, and say that seventy-five per cent. of the mothers do not give half the care to their children's teeth that they ought to have. We, as

dentists, I think have a great responsibility in that direction. Anyone who has practiced dentistry long knows that he has to depend largely upon lady patients for his practice. A great majority of these lady patients are mothers, and we have the opportunity of instructing them along this line, and I think it is our duty to do so. Some men may think that we will probably acquire a reputation similar to that of the average barber, of being too loquacious, but I do think that we do not talk sufficiently along the right line.

Dr. A. J. FLANAGAN, Springfield, Mass. For fifteen years I have been listening to discussions of the question of dental education of the public and dental inspection of the mouths of school children, and what has it come to? We have been doing a lot of talking, but what are we accomplishing? Did it ever occur to you, gentlemen, how medical inspection reached the schools? Do you think for a moment that they did it by talking alone? That one individual did it? Not at all. Did you ever stop and think that medical men were the cause of having medical inspection in the schools? Now, we have been talking for fifteen years; we are still talking, and have accomplished nothing of a practical nature—and that to me is the most irritating thought. You have here in New London a dental society which represents a certain area; you also have in this area a medical society which represents that area; have you medical inspection in the schools?

Dr. CROSBY. No.

Dr. FLANAGAN. Well, we have in Springfield, and in many other places in Massachusetts. Not only have we this inspection, but the physicians are paid for doing it. Now, how did they do that? They did it by taking a hand in politics—if you want to call it that. This has come about by putting a physician at the head of each board of health—finding out what that physician's ideas were before he was elected. When that man obtained his position on the board, what did he do? He made sure that his friends in the medical society would help him

in this matter of medical inspection, and by educational campaign methods soon secured results.

Now, if the dentists are, as Dr. Horatio C. Wood once said, men of partial culture, they should at least have partial knowledge of politics. If physicians can do all this legitimately—and if legitimately it must be ethically, and I have not heard it questioned ethically—why is it not our duty to elect dentists to the board of health—men who have force of character, men fit for the position, and whose opinions would be upheld by the public and the profession. If we had only done more practical work, we would not have been talking for fifteen years for nothing. I claim that the whole trouble lies not with the public, not with the physicians, but with the dentists. They are doing little more than talking.

Another thing. Someone spoke of educating mothers, educating children, educating the public in the care of the teeth. You have in every hospital of any consequence at the present time a training school for nurses. Have any of you gentlemen here had the honor of going before a class of nurses in one of these hospitals, and talking on the care of the teeth? I know of but one place where that is done, and that is in Springfield, Mass. There are three training schools for nurses there, and at one of these schools, twice a year, lectures are delivered on the care of the teeth; and that, gentlemen, was brought about by one man making an effort. If you have training schools for nurses, and they have lectures on medical subjects, why not have lectures on dental subjects, along lines of help to nurses and to the public? Nurses, above all others, need to know something of the care of the teeth and associate parts, in health and in disease.

Dr. CROSBY (closing the discussion). In reply to Dr. McManus, who said I did not make quite clear the status of this movement in New York, I would like to say that the present examination of children's teeth, as well as other examinations for their physical welfare, is made by the school physician. The movement of Dr. Wheeler and

his associates is for the purpose of accumulating statistics that will show the need for the appointment of a dentist on the board of health. They did not feel that they would be justified in asking to have that done without first collecting statistics that would demonstrate the necessity for having a dental representative on the board. Another thing that impressed me in regard to teaching children to take care of the teeth and so establish a state of hygiene, is that they look upon it as a matter of polish, somewhat as they look at the matter of blacking their shoes. They know that it makes them look better, but what is the use? They do not look at it as a matter of consequence to their health, a point that should be impressed on their minds.

In the care of the infant's mouth after feeding, the mother feels that she must wipe out its mouth or the baby will have colic. Now, as the child grows older and more vigorous, although, better able to throw off the marked effects of fermentation in the mouth, still he will suffer from digestive troubles. Digestion is considerably impaired by decay of the teeth and food-decomposition in the mouth. Precaution against these evils would make the child grow up stronger and with better health. The general physical condition of the child is improved by dental prophylaxis, and it seems to me that it would be well to educate the mothers and children in regard to these points.

The next order of business as announced by the President was the reading of a paper on "Our Old Stand-bys," by Dr. EDWIN WHITFORD, Westerly, R. I.

[This paper is printed in full at page 936 of the present issue of the *Cosmos*.]

Discussion.

Dr. JAMES McMANUS, Hartford. I will say a few words on the question of amalgam, and I am rather glad to do so, because our president, in his paper this morning, read an advertisement of Dr. Clowes which was printed in the New London papers years ago. I had the pleasure of knowing Dr. Clowes for a

number of years, and he was considered the best amalgam worker in New York, and that meant a great deal, although there have been probably as fine workers in the small towns as in New York, and of the good ones in the latter city many, like Dr. Clowes, had come from the country. New London was quite small when Dr. Clowes went to New York.

In that advertisement he speaks of his triumphant operations. I have seen a great number of amalgam fillings put in by Dr. Clowes, some almost infinitesimal in their size, others covering the entire tooth, and others where the teeth had been very much exposed to decay and were all filled, in a way that I had never seen until I saw his operations. There was a feature of his amalgam work which to me at the time was very amusing, viz, the way in which he would build up artificial teeth to improve occlusion after they had been worn for several years and the plate had settled in the tissues. He would with a wheel cut grooves in the porcelain teeth, and build amalgam into these grooves until he had as perfect an articulation as one could desire. It was a queer use to which to put amalgam, but to my mind one of the most successful and, done as he did it, as good as anything. I do not know that it would be possible to do as good work with any other material we have today. I have great faith in the use of amalgam in many of the broken-down conditions that we meet with, and which the essayist demonstrated.

I had little experience in this line as a young man, because my preceptor never used amalgam. He never put an amalgam filling in a tooth in the eighteen years that I was in his office. He used nothing but gold and tin. At that early time we did not have Hill's stopping. He was a fine gold operator, and a fine operator with tin, but occasionally he would send a very bad case to Dr. Riggs, to be filled with amalgam, because Dr. Riggs was known in those days as the finest amalgam worker in that section. And so, as I say, I never had any experience with amalgam until I had been in practice quite a number of years. I believe.

however, that many teeth can be saved with this material in a much more favorable way than by grinding the teeth and crowning them, as many are doing today. I think the profession of the country have done an immense amount of damage to patients by foolishly grinding teeth and crowning them with gold, when with patience and care, and, in time, cultivated skill in the use of amalgam, they might have saved teeth and given their patients much more comfort, and caused less of nervous strain in having work done.

Dr. J. W. BEACH, Buffalo, N. Y. As Dr. McManus has said, there is no material which can be used to so good advantage for the salvation of badly broken-down teeth as amalgam. I think it was the late Dr. Flagg who said that in proportion as teeth needed saving, gold was the poorest material to employ, and he might have continued, that amalgam was the best.

Dr. G. A. MAXFIELD, Holyoke, Mass. The essayist has brought out some very excellent ideas, but there are a few points I would like to criticize. I have never yet in my practice seen a tooth needing building up as badly as he has described, and having a living pulp. In all the cases that come to my hands as badly broken down as he describes, I always find the pulp dead. I know we may have very large cavities in molars and yet the teeth still have living pulps. If a great deal of restoration be needed, I think it a very unwise practice not to devitalize the pulp. The essayist says he has been practicing this system three years, and has not had trouble with any case. If he lives ten years longer, he will find these patients having trouble. Further, they will either have pulp-nodules in the teeth or the pulps will die and abscesses follow—most likely pulp-nodules, with the resultant neuralgia which the patient cannot place. I have had a great many cases of neuralgia of eight or ten years' standing—all arising from the capping of the pulps. If a patient has ever suffered from pain in a tooth having a live pulp, and that pulp is capped, it will in time become the seat of inflammatory conditions.

Now, I believe in saving a pulp where possible, because after its death the tooth becomes brittle, and under the stress of mastication there is more likely to be a breaking down of the structure. So I endeavor to save pulps where I can, but never if there has been pain through the near approach of caries to that pulp, for I realize how severe the consequent neuralgia will be as a result of that capping. In some cases where the pulp is capped, the irritation will cause the pulp to recede in the cavity, and in that case the root-canal may be explored a considerable distance down the root before causing sensation; but these cases are rare. More often there is a deposit of calcium salts in the pulp itself, and consequent neuralgia.

Another thing in regard to the mixing of amalgam. In one of our recent journals—I think a western one—someone has given a very interesting series of experiments with alloys, and the conclusion of these experiments is that bad results come from amalgam because it is not properly amalgamated. I do not think you can properly amalgamate alloys unless you use an acid aqueous solution in the mixing. This point was given to me by the late Dr. Clapp of Boston, some seven or eight years ago, and I have since employed the following method: Take hydrochloric acid, one part, and twenty parts of water; place the mercury in the mortar and pour on a sufficient quantity of alloy; then cover that with the acid solution, and you will be astonished to find how quickly the alloy will amalgamate. At the same time the dross is removed, and perfectly clean amalgam will be the result. After amalgamating it thoroughly, wash it off in the mortar with clear water, and then, drying it on a napkin, you have a very clean alloy, and one that keeps bright in the mouth.

Another thing. In large amalgam fillings I think one should be as careful to polish them as one would a gold filling. I have some patients in whose mouths the polish has kept admirably for five years. I remember Dr. Flagg's advocating the use of a smooth stick in the

polishing of an amalgam filling, drawing the stick in the same direction all the time, and so making the lines in one direction, and leaving the filling in that condition.

Dr. A. J. FLANAGAN, Springfield, Mass. Some years ago, before the National Dental Association, Dr. Hungerford made the claim that where the pulp is liable to die later on, it is better to destroy that pulp and then remove it and fill the root-canals. And, gentlemen, why? Dr. Hungerford produced this scientific thought, and asked each one present, where they had pulpless teeth to treat, which were the cases that produced the most trouble in practice; and invariably they said, in the words of Dr. Flagg, "Those sleeping volcanoes that went along so many years after capping, and then all of a sudden there was an eruption almost equal to that of Vesuvius." These are the ones that you have trouble with. At least I have, and I think others do.

Where is the trouble when one treats such a tooth? It is beyond the apex of the root, in the immediate vicinity of the former. Then it is a serious question to successfully fill and save these teeth, whereas if they had been devitalized in the beginning, and filled properly, we would have had, from the standpoint of science and clinical experience, better results. I do not think anyone can controvert that. I think Dr. Hungerford is right, and believe we must uphold that which science has produced.

Dr. Whitford spoke of the originality of the idea. I say it is original, because he did not know anything of the work of others along the same line. Even though you may go back, and see in the *International Journal* that Dr. S. E. Davenport of New York came to Springfield some years ago and showed this same method—and I think there were men before Dr. Davenport who practiced it—yet that does not detract from the value of Dr. Whitford's good work or his credit for producing what he has.

Dr. WHITFORD (closing the discussion). There are several points upon which the best of us must be at vari-

ance, and I presume that the life and death of the pulp will always be in dispute among the members of the profession. I did not say in my paper that I capped every nerve, for I do not, but I think that there are cases when by capping an exposed nerve its life can be preserved. Of course we cannot look into the future very far, and see how long a tooth we have worked upon will live, how long it will take to die, and how long it will remain in a decently dead state.

Dr. Maxfield was inclined to be pessimistic, but I am rather inclined to be optimistic. Of course I do not wish to take sides against Dr. Maxfield, with his long experience, but I have a tooth here now that has been filled for some time, and is today in a healthy condition, that under any other method would have been devitalized. I do not claim to cap every exposed nerve, and I said in my paper to be careful to test the tooth, and see what it is good for. Dr. Maxfield said that after a tooth has ached, that tooth is bound to die. Perhaps he is right. The first questions I ask my patient are—Has the tooth ever been sore; has it ached; is it sensitive to hot and cold water? Any one of these questions answered in a certain way will prove the advisability of certain procedures.

But when a person comes in with a tooth broken down, perhaps from erosion, so that the tooth looks badly, I would like to have you try this method. It is one from which I have never had any trouble, and the test given is one which I think will enable almost anyone to tell whether the tooth will remain alive or die. I would not be understood as capping every pulp that comes to me, but I devitalize teeth the same as does anyone else. There are many exponents of capping pulps who will keep under treatment, week after week, a tooth that has been aching, to see if the pain will cease, and if it does they cap it. Anyone would say that that tooth will die, and I agree with you there.

One of the speakers referred to the manner of mixing alloys. That, I think, does not enter into the subject of the

paper proper. I do not recommend any special manner of mixing alloys, but believe in every man doing it as he pleases, provided he uses a good amalgam and gets it dry before putting it in the cavity.

One gentleman spoke of the "sleeping volcano," which is a very apt illustration, but I have seen some devitalized teeth that acted like volcanoes.

Now, gentlemen, coming right down to the rock-bottom truth of the matter, how many here can take an upper molar with crooked canals, and get every particle of the pulp out? Those who can, say "aye." [No answer.] Of course this proves nothing—I am willing to admit that, but there are sleeping volcanoes in teeth after they are dead. If you can take a tooth and cover it with a gold cap with the pulp alive—and many do this—certainly you can perform the operation I describe, and the chances are that the results will be favorable. Just because a tooth looks dark and perhaps somewhat doubtful, I do not see that that is any reason why you should devitalize the pulp. As long as the tooth answers the requirements of a perfectly calcified one, I think it is far better to keep it in that condition. I would not say pursue this method after a tooth is broken down, and the soft structure filled with septic matter, but we often find black teeth that are as strong as any other. Such a tooth as that I think can be filled, and filled alive.

I have a young lady patient here today in whose mouth I shall be glad to show a tooth that has been treated after this method, and I will say that it was not done with any idea of showing it at this meeting, but it illustrates the method of treatment; and the patient will tell you that it is no more sensitive than any other tooth she has.

I wish to thank the society for the courtesy shown me, and to thank the gentlemen who have taken part in the discussion of the paper.

The next order of business was the reading of a paper on "Burnished Gold Fillings," by Dr. G. M. GRISWOLD, Hartford.

[This paper is printed in full at page 938 of the present issue of the Cosmos.]

Discussion.

Dr. A. J. CUTTING, Southington. I wish to sanction all that the essayist has said, and while describing the method as I have practiced it I will incidentally emphasize, and perhaps more fully round out, some of the points that he has made in his paper.

For instance, with regard to cavity preparation: I would not go into the detail of cavity preparation, but I wish to emphasize the fact that we must be very careful not to have too sharp angles where they can be avoided. If you wish, have every corner round. If a cavity must have sharp angles, by filling in with the cement you fill in the angles, and it does not make so much difference; but my practice is not to have a large amount of cement unless I want to avoid the effect of thermal changes. I do not think the practice of using a thin layer of cement as lining for our cavities is sufficient to make much difference with the thermal changes. If I have a shallow cavity in an extremely sensitive tooth, where I do not feel warranted in putting the patient to the pain necessary to make much retention, I trust a good deal to the great adhesiveness of the cement. I use the cement thinner than for a deep cavity, where the shape of the cavity is such as to hold the filling, on the principle that the least thickness of an adhesive cement is stronger than a body of cement. This is the same principle as is applied by the carpenter in gluing furniture—he does not use a bulk of glue, but as thin a coat as he can get, with a very close joint. If you do the same with any of the adhesive cements—such as the inlay cements—and let them properly set, you will have an adhesion there that will hold the filling. But if you have a deep cavity and want the benefit of a body of cement, then use it thick, partially filling in the cavity and gently pressing into it a layer of gold, letting the cement harden before you burnish the gold. One of the stumbling-

blocks in this method is that you are likely to be deceived by the unconscious tipping of the filling when you start to burnish. When this happens you will find that later the filling will loosen and come out.

The essayist has said that he does not care for the blued instrument. I do, because I do not have to stop to polish the instrument. I started to use this method by employing the highly polished unblued instrument, but the only objection to it is that the instrument will soon become coated with the gold, and one must continually stop and polish the instrument. But if you use the blued instrument, the gold, as long as the blue is there, will not stick to it; and if you find a tendency to drag your gold with the instrument, you need only hold it in the flame a moment to re-blue it, which will stop that tendency, unless it becomes coated with gold, when it must be polished and re-blued. The essayist tells us to put in the gold and pack it to place with a little pressure before burnishing. I burnish from the first. I have never used the electric annealer. I pick the gold from the tray with the burnisher and pass it through the flame, heating it to a cherry red, put it to the filling, and if the latter be properly condensed it will almost jump to place. There is one thing I try to avoid, and that is not to catch any air under the gold. Perhaps you have never had that happen, but after you attach your gold, and lap it over and over, sometimes you will have in the finished filling little pits, and this I attribute to air getting under the gold.

With regard to the style of instruments to use, I would say use any instrument with which you can reach all parts of the cavity, and burnish from the center, bringing the filling along the walls in such a way that you have ultimately a saucer shape as you approach the outer surfaces of your filling. One of the things that annoyed me most when I commenced this work was the fact that occasionally after I had gotten a filling nicely finished, in a short time the patient would come back, and I would find

the gold flaking off at the outer margins. After testing and trying fillings of this character, I came to the conclusion that I had not properly condensed the filling next to the enamel wall of the tooth, so now I am particular as I approach the enamel surfaces to so condense with my burnisher as to be sure that the surfaces of the filling all around the margin of the cavity are as solid as I can make them, and when I have done that I do not have any flaking. I use right and left flat burnishers of greater or lesser size for most of my work, and am very careful that no air is caught within the layers of gold.

In starting the filling with cement lining one may use any form of gold, but I prefer the fiber gold, as small particles of the gold will enter the cement and make a more perfect union between the gold and the cement.

This is a practical subject, and one that I am surprised to see so many hesitating about adopting.

One of the questions I am often asked when I am giving a clinic is, Does it save time? Well, that depends upon the operator. It is much easier for the patient than for the operator. If you are going to take the method up with the idea that it is easier to do, you will find that you are mistaken—I have not found it so. My wrist aches many times when I have finished a filling, but the patient will often be sleeping soundly. It is hard work when we use finger-strength sufficient to give a thorough burnished condition to gold. But I say, it is much easier on your patient. You may be able to save time if you are quick enough, or you may not, but when you get through with a filling after properly applying this method you have a solid gold filling, and you have done good work for your patient.

Dr. E. H. MUNGER, Hartford. I am a decided convert to this method. I have been using it nearly as long as Dr. Cutting and thoroughly believe in it. All of us have had nervous patients complain of the use of the mallet in gold work, and I believe that as dentists it is our duty to relieve the patient as much

as possible from avoidable distress and annoyance.

Dr. Griswold says the method is easy. In some cases it certainly is, and in others I agree with Dr. Cutting. A few days ago, when I built out a large corner of a tooth, my wrist ached when I finished the filling, but the patient was in a better condition than if I had used the mallet, and had as good a filling. Certainly you can with care make a very dense filling, and I believe that you can take a tooth that is soft and weak—too much so to bear the use of the mallet—and insert a gold filling by this method. I remember, during the days when I first used this method, one patient—a Swedish girl with characteristic soft teeth—in whose mouth I had put a number of large fillings, and I was anxious to see the patient again to note the results. About fifteen months after that I saw the patient again, and I was happy to see the results. These fillings were as perfect as when the girl left my office after the work was done, and I do not believe, in fact I know, that I could not have placed gold fillings in her mouth, using the mallet, and have them come back in the condition that they were in. As I say, I am a thorough convert to this method. I use the electric annealer. I have one or two blued instruments that I do not depend upon. Undoubtedly, if you do not use the electric annealer, you need to use the blued instruments, but if you have the electric annealer, the blued instruments I think are not necessary.

Dr. L. C. TAYLOR, Hartford. I know many men who are using this method as they have used many others, trying to pack gold against walls where there is no affinity. But men today who are packing gold against teeth, and trying to save them in that way, cannot be called anything but back numbers, even though they are in the majority, because there are so many men who are teaching a better way; and I am glad to know that our friend here is standing up for the right, even though he says he has been using this method for only two or three years. I have been using the method for eight

or ten years, not only for burnishing the gold, but for malleting it.

I must take exception to the burnishing process, when it comes to a large corner of a tooth. In places where there is considerable leverage afforded, I do not believe you can make a gold filling as strong with the burnishing process as with the mallet. I believe, however, for ordinary work, you can make a better filling by burnishing than is possible with the mallet. You hear so many men speak of the fear of getting a little of the cement on the marginal edges of the cavity. It is true that this is liable to happen, but supposing it does! Turn right around and ask any man who is doing porcelain work, and he will tell you that he has this line of cement in every porcelain inlay. With the exception of the objection to its color, there is today no method of filling teeth which is as good as the practice of building them up with gold, and particularly over this cement medium, which preserves the tooth-substance. To attempt to save teeth with gold today I consider poor practice, because methods of using cohesive gold now are far superior to the old way of trying to pound gold upon the tooth-structure, which would result in a filling around which the tooth would turn blue in a short time. In many cases there is every appearance of perfect walls, yet the tooth is turning blue, which is proof positive that that filling is leaking—and when a gold filling is leaking, although it may be a slow process, it is going back on us.

Now as to the question of whether it will last as long as some of the gold fillings that we have seen last for thirty or forty years—fillings made in teeth that did not need preservation, which accounts for their having lasted forty years—whether it will last that length of time I do not know, and I do not care, because even if it does fail in five years, I can say that if you have your lining right, you will then find the tooth in a splendid state of preservation, and it is a very easy matter to insert a new filling. But with the wide line of decay which comes from improperly pounding

gold into soft teeth that never should have been filled that way, it is an entirely different matter.

I am a believer in this method; it is a true step forward. Many are talking theories, but, going back to first principles, modern and oral hygiene and the hygienic fillings are doing more for tooth-preservation than all the other theories put together.

Dr. HUGH DRYHURST, Hartford. I have been waiting for someone to say something of the failures with this method. I cannot entirely approve of it, because in the last few weeks—since I have had notice of this discussion—I am sorry to say that I have come in contact with fillings inserted after this method where the palatal walls of the cavities have been broken away, whether by too hard pressure in the burnishing of the gold, or whether the enamel margins were cracked in the packing process, I do not know. On the labial side of these fillings I have also noted that the gold has cleaved away, more so than in any filling that I ever saw in my own practice of fifteen years' experience; consequently I think we have failures in that line as well as with the old method of using the mallet. Not that I advocate wholly the method of malleting, but I

think a filling inserted in that way is just as dense, just as firm, and just as solid, as the one that is burnished in.

I would like to ask what is the cause of that breaking away? Dr. Cutting says one trouble is in getting air under the gold. That I think is probably the cause of the gold flaking off, but I would like to ask what would be the explanation of the breaking off of the enamel margins? I do not think that we as dentists should desert the old methods for new ones until we find that the latter are doing superior work.

Dr. GRISWOLD (closing the discussion). I prize very highly the remarks of Dr. Cutting, because he has had long experience with this method, and I think this testimony is worth a great deal to all of us. Personally, I have had but two years' experience with it, but am satisfied that it is good. I have had twenty-eight years' experience in packing gold, and believe I know when a gold filling is well condensed, and for that reason I am a convert to this method. With regard to Dr. Dryhurst's remarks, I wish he would try this method for his own satisfaction. If anyone does not believe in it, let him try it. The proof of the pudding is in the eating—try it.

(To be continued.)

NORTHEASTERN DENTAL ASSOCIATION.

Twelfth Annual Convention.

(Continued from page 867.)

THURSDAY—Afternoon Session.

The meeting was called to order Thursday afternoon, October 18, by the president, Dr. Barrett, at 2.30 o'clock.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The first order of business was the reading of the report of the Committee

on the President's Address, by Dr. HENRY McMANUS, as follows:

Your Committee on the President's Address has the honor to report that—

While we find a wealth of fine and admirable thought worthy of careful consideration and hearty indorsement in Dr. Barrett's address, the recommendation which in our opinion is the most vital to the welfare of the general public is in regard to the care and supervision of the teeth of the public school children.

Therefore, in recommending that the address shall be printed in the Transactions of the Northeastern Dental Association, we further suggest that a special committee of six members from each of the several states within the field of the association be appointed to confer with the state boards of health and education, to formulate a plan whereby the absolute necessity of clean and healthful mouths may be so demonstrated that their concerted effort will assure the establishment of dental inspection in our schools.

HENRY McMANUS, *Chairman.*

Dr. L. D. Shepard moved that the report be accepted and the recommendations be adopted.

The motion was carried.

Dr. Shepard also moved that the chair at his leisure appoint the committee provided for in the report.

The motion was carried.

The next order of business was the reading of a paper by Dr. JAMES TRUMAN, Philadelphia, Pa., entitled "Wanted!—A Pathological Sense."

[This paper is printed in full at page 815 of the August issue of the COSMOS.]

Discussion.

Dr. C. A. BRACKETT, Newport, R. I. I can hardly conceive of a more honorable assignment than to be permitted to make any remarks upon a paper by such an essayist as the one to whom we have just listened.

The first remark which I would make is that much of any expression which an individual may make, or any feelings or thought which he may cherish, depends very largely upon his point of view; and again, in considering and weighing the statements of any man we need to bear in mind his individual viewpoint. With reference to the viewpoint of the essayist it would not be becoming in me to make any remarks, but it is right and proper that I should clearly state my own viewpoint, in order that you may know something of what my prejudices and views are. Now, I believe that there is some peculiar usefulness in the world for the man of radical ideas, for the man of a single

idea, for the man who goes to extremes, for the man who is spoken of as a crank. The man accused of being a crank, you will remember, said that a crank was something that turned something! So that the extremist and the one-idea man has his place—at least as a means of attracting attention, of arousing inquiry, leading, in dentistry, to investigation as to whether we are doing that which is best for our patients. The practice of dentistry in the past has been influenced by the extremists, and as we find it today it is quite in accord with the progress in all other lines to which the human mind gives its attention. In the modifications of religious belief, in the better interpretation of the common laws, in the practice of medicine, in the practice of surgery, the enthusiastic radical is the man that has had a very material part in the pushing on of the car of progress.

As a matter of personal observation. I believe that in the inconsiderate and indiscriminate introduction of bridges there has been a failure to always subserve in the best way the interests of the patient. There have been glaring instances in every direction in which that one idea has been carried to an extreme. I think the great fundamental idea is substantially true that the less we have of artificiality, generally speaking, the better will it be; for the natural denture can be so judiciously cared for as to accomplish all the service required of it, to better advantage than can any artificial substitute. We all agree that there is no artificial substitute that is the absolute equivalent of a full natural denture in a healthy environment. In case of the loss of a portion of the denture, then of course it becomes our duty to do the best we can by judiciously selecting an artificial substitute. But sometimes it happens that we have to choose between inserting an artificial substitute or leaving the mouth without its full complement of teeth. Now, I believe that there are a great many mouths in which the presence of vacancies are in a general way better for the patient than their obliteration by artificial substitutes; for.

just as the essayist says, the introduction of a substitute brings in a pathological condition that otherwise would have been absent. All these contrivances and appliances should be used with the utmost discrimination and with great care, according to the doctrine which was so well expressed by one of the teachers in my school days, substantially in these words: "It should be the object and ambition of the dental practitioner to do for the patient that which will provide him with the best masticatory apparatus for his whole lifetime, and, all other things being equal, with the least expense to him."

Now, where we shall draw the line as to what is judicious to do in the way of bridge work, and what is not, each individual must determine for himself. I have never yet seen an instance in which I felt justified in mutilating two good, sound, healthy normal teeth for the sake of making abutments for a bridge. I do bridge work and I do crown work, but I do not put on crowns, as a rule, if fillings may be made to serve the purpose, and I do not put on bridges where good crowns remain; that is where I draw the line. Another man may just as conscientiously draw his line in a different place. I have lately removed a bridge which supplied lower teeth on the left side, and which had as its only support a canine and a lateral incisor. When it was removed the canine was entirely separated from all living connection. The tremendous leverage had led to the entire separation of the tooth from its pericemental membrane, and it had made the lateral so loose that there was some doubt about its becoming firm again. This is an instance in which the use of bridge work had been unjustifiably abused. There are cases in which the banded crown is decidedly indicated—as, for instance, when the strain upon the teeth is such that without the band the root would be likely to split, also on roots already split.

There is another point which the essayist referred to, but which he did not elaborate, that I wish to speak upon for a few minutes. When I read the title

of the paper, "Wanted!—A Pathological Sense," the interpretation which I put upon it was that his intention was, "Wanted!—Skill in Diagnosis." He did make some reference to the importance of skill in diagnosis. There is nothing of more practical consequence for our success as practitioners and for the well-being of our patients than that we get at the real causative factors of any pathological condition that may influence the health of related regions, or of the whole system. The more proficient one becomes in recognizing pathologic expressions in the region with which the dentist is most intimately concerned, the more will one realize that the oral cavity, the nasal cavity, the pharyngeal cavity, and the organs of hearing and seeing, are intimately related to each other, and that it is of much consequence that one have some knowledge not only of the particular specialty which he may practice, but also of the intimately related contiguous regions. Everywhere throughout the country there are instances of specialists treating manifestations that have their origin in organs outside of their own specialty. There should be an intelligent understanding of all these relations, and no man should undertake the practice of a specialty like ours without having some general knowledge of pathology. No man should proceed with the treatment, and certainly not with the sacrifice of an anterior tooth, until he is satisfied that there is not a tooth posterior to it that might be the real mischief-maker. No man is qualified to treat a pain in the temporal region, or in the region of the ear, unless he be familiar with the pathology of the third molar. So I feel very earnestly that in these matters there is wanted a pathological sense, a broad view that shall take into account all outside influencing factors. We should not, as was so excellently put before us last evening, undertake the diagnosis of a condition of malocclusion of the teeth without knowing something of the condition of the throat and nasal cavity.

I am not one of those who believe that the only good days were the days of the

past. I believe that there has never been a time when the importance of the health of the mouth was more thoroughly appreciated than it is at present. More of the everyday practitioners, when they examine the mouth, are able to discover pathological expressions, and to a greater extent than was the case a number of years ago, together with a greater appreciation of the possibilities of oral hygiene in its bearing upon the maintenance of a healthy mouth; so that I certainly do not think that at the present time we can be much worse as practitioners than those who preceded us.

At different periods in the history of any calling, differing requirements are presented. Those of us who are oldest have heard from men who were old when we were young something of the hardships, something of the struggles, something of the difficulties and the privations, something of the peculiar harassment of those who were the early settlers on these shores in the bleak season, and who went on clearing away the hindrances, cultivating the fields, and laying the foundation for the prosperity which has come later. And such an essay as was given us by Dr. Guilford this morning is needed; we do need to work longer, we do need faultfinding, stimulation, and to have our shortcomings pointed out.

There are a great many men in the labor world today who are pleading for the eight-hour law as the maximum which they propose to contribute to the world's working forces. I do not want to stir up any acrimonious discussion on the labor question, but if all humanity limited its productive effort to eight hours, the progress of the world would not go on at the rate at which it is going today. The man who assiduously seeks to do not more than eight hours' work, and the one who does less than that—each is wasting the world's material, wasting the world's productive capacity. Now, as the essayist told us this morning, there are men who follow the practice of our calling in that spirit, but those who do not so follow it are very numerous; there are men who think the

day is never long enough, and men who are strenuously doing their utmost day after day to push forward the car of progress.

Those of us who are older, and have had some personal knowledge, would assent easily to the assertion that some of the very best work which has ever been done in saving teeth was done by our professional grandfathers—in the face of the many disadvantages that limited their resources, but with such horse sense and with such qualifications as the times afforded. Individually, then, I believe that nothing could have filled the places of these men in the chain of events. But none of us, while we bow with most profound admiration and real veneration to the attainments of our grandfathers in our calling, would assent to the assertion that the practitioner of the present time, with the progress which years have brought, with the increased advantages, the improvements, the opportunities that he has enjoyed, is not a better all-round practitioner than was his professional grandfather. We admit that there is very much in the present that is unnecessary, very much that should be omitted, but I hold sincerely and earnestly to the declaration that there has never been in the history of the world a time when there was so much energy so well directed as at the present time. Extremists may go too far, pessimists may point out to us that there are bad things, but in everything their influence counts for the well-being, for the happiness of humanity. There never has been a time, I repeat, in the history of the world when there has been so much of goodness, so much of well-directed energy, so much reason for congratulation in the present, and so much reason for the utmost hopefulness as to the future, as right here and now.

Dr. LEARY. Pathological sense, as I read it, is the result of observation and study of pathological processes. Pathological study of disease and physiological anatomy in its essentials is a study of the reaction of the tissues of the body to injury.

Years ago, when talking to an old

practitioner who received his education before the discovery of bacteria, he said to me that the germ theory was all bosh; that he had delivered over a thousand women without even washing his hands, and that he had never lost a single case. My answer to him was that God had been very good to him. Ignorance of pathological processes, I think, has been one of the important sins of the dental profession. It is inconceivable that with all the mechanical manipulative methods required in the treatment of teeth the soft tissues are not occasionally injured. It should be remembered that immediate as well as remote results may follow an injury to the oral tissues. Tuberculosis of the mouth is looked upon as one of the most serious conditions, and it has its origin, we believe, usually in the introduction of Koch's bacilli into an injured area.

I said that I wanted to thank the essayist on behalf of the teachers of the so-called medical branches of dentistry—for the reason that the average dentist is impressed more particularly with the importance of the mechanical aspect of dentistry. Now, I believe that dentistry is to be congratulated upon the splendid work it has accomplished in a mechanical way, but it seems to me that its development has been one-sided. While it is indispensable that the dentist should be a good mechanic, and although as much attention should be given to pathology as to the manipulative aspect of the profession, yet it is the rarest thing to find a dentist paying much attention to the study of the various pathological processes which take place in the tissues.

It has always been a wonder to me that with the opportunity for experimentation with the many appliances at your command, you should not have embraced the opportunities to study their effects on the soft tissues in the mouths of animals.

Dr. THOMAS FILLEBROWN, Boston, Mass. Henry Clay had a very large mouth, and an old Indian, trying to describe him to some of his friends, told them that Henry Clay was a tall, broad-shouldered man, had a high forehead,

a large nose, "and his mouth," he said, "speaks for itself." The paper has spoken for itself; any word of commendation would be superfluous on my part, and anything I might say would not enhance its value. I wish to add the testimony of my experience and observation as to the evil effects of the principle which is applied so extensively in the practice of extension for prevention. It is the simple testimony that you cannot with impunity cut away and injure these organs to so great an extent as many do without subjecting them to irritation, not only from the filling, but also from temperature changes, which may result in the devitalization of the pulp. Also I want to indorse what the writer has said about grinding and cutting away the enamel of the teeth. If you grind off the enamel of the tooth and put on a closed cap with cement in it, it is almost sure to devitalize that pulp. I have seen these results many times.

I want also to add a word in regard to the temerity—I call it—of the profession in going on and interfering with the pericemental membrane around the neck of a tooth to such an extent as has been done by the application of bands and caps, and the great injury done the teeth. Nature will brook no such interference.

I acknowledge the value of the crank; I acknowledge his power for good—that he turns the world; but the crank who is so much of a crank that he is going to turn to the destruction of everything else, and who is without an idea or thought or consideration for any other circumstances, is too extreme; he is turning too fast, and is doing injury. I am sorry to say that humanity at large is so constituted that no great reform can be brought about without sacrifices. Liberty was not won without the sacrifice of thousands of lives. Civilization makes no progress without the sacrifice of lives and property, and so I suppose that in our own special line of work we shall have to submit to similar conditions. By and by, I think, the pendulum will settle tolerably near the correct point.

I suppose as one grows older he grows conservative. I think that the tendency for the past ten years has been too much toward the mechanical side of dentistry; it does not seem to me that there is as much enthusiasm for the scientific side among the young men of the present time as there was among the men who were young some years ago. I hope that that also is but the swinging of the pendulum, and that by and by they will wake up. My own observation has been that dental practitioners and students who have made progress in scientific investigation, and have worked upon something worthy of attainment, have not been acknowledged to the extent that they deserved by the dental profession of the period to which they belonged—not to the extent, at least, that medical men have recognized progress and the able men of their own profession.

For instance, are young men interested quite as much as their obligations demand in prescription-writing? They ought to have this knowledge; they should be expected to write prescriptions. There are exceptions, but the large majority fall short. And so it seems to me in regard to other studies—say anatomy, chemistry, etc.; they look upon what they get of these studies as something quite unnecessary, and are too well satisfied if they can be fairly skilful in mechanical work, and have just enough of the scientific studies for decoration and to pass muster.

Dr. JAMES McMANUS, Hartford, Conn. I enjoyed the paper very much, and wondered while listening to it if it was affecting many of the gentlemen present as it affected me. In listening to the paper I felt that Professor Truman was making a grave arraignment of the majority of the practitioners of dentistry in this country. If I understood him correctly, he says that the majority of practitioners of dentistry have been reckless and brutal—that is a strong word to use, but I say it again, *brutal*—in the treatment of their patients. And when, as all of us have done, we have removed not only crowns, but bridges and artificial work, from the mouths of patients

who have been deceived, we know, in the character of the work performed for them, with the damage to the tissues caused by it, that we are inclined to agree with the essayist.

I was very much pleased this morning in listening to Professor Kirk, especially with the way in which he spoke of our craft—he did not call it profession. I think craft is the proper word to be used in relation to the majority of the practitioners of dentistry, especially when you think of the number of men practicing our calling today who are not educated, notwithstanding their having been graduated by dental educational institutions—men who do this imperfect work. We cannot even look upon them as craftsmen, but as artizans and mechanics of the poorest order. Bridges are put in without any regard as to what may happen in the future—they simply cut away the teeth, crown them, and swing a bridge over the space without having any regard as to what may subsequently occur.

Now, the trouble is that the student has not realized that he has something more to do in studying dentistry than to devote his efforts solely to the mechanical side of our work. We want men to begin to study; we want professors to teach the students what to study, and we want students to learn not only the physiological, pathological, and anatomic conditions, but we want them to learn the bearings of all these conditions on the health of the mouth, and work from a standpoint of knowledge of physiology and pathology. Then we may begin to think that the time is coming when dentistry will be regarded as a profession. We have at present many highly professional men in the country, but unfortunately the majority practicing our calling are simply craftsmen.

Dr. TRUMAN (closing the discussion). I do not know that there is any necessity for a continuance of this discussion. I wish, however, to define my position in this matter a little more clearly. I did not come here to arraign the dental profession—for I claim to be one of them. and I claim also to have made mistakes

—but I do think, and have thought for a long time, that the men of our profession are too much absorbed, as has already been said, with the mechanical side of our work; that the pathological is practically laid aside, and that we are doing work without proper precautions. I want to see the young men practice always with the thought as to the consequence. I know very well that bridges, crowns, and bands may be useful at times, but that which is to be considered is the question of the special conditions that will justify their use.

I did not enter into diagnosis, but the whole paper leads in that direction. I thought that if I read this paper to the men of New England it might go out into the profession, and assist in drawing attention to better methods of practice in possible pathological cases.

I was in attendance at a convention only a few weeks ago, and in that whole gathering not one had a word to say in regard to the danger resulting from bands on the peridental membrane; and when views such as have been given here were advanced they were regarded with astonishment, as though I was expressing an idea that could not be sustained in practice.

I do not agree with my friend Dr. McManus in calling our profession a craft, for in my opinion a bad name given will do much to injure any calling. I insist that dentistry is worthy of the professional title where properly practiced, but I fear that this proviso is not applicable in many instances.

I do not care to extend this discussion. The brief paper speaks for itself, and I hope it may have some influence in causing practitioners to hesitate before performing the varied operations required in dentistry, and to consider the relations which these operations may have to those portions of the human organism with which we have to deal.

The next order of business was the reading of a paper by Dr. M. H. CRYER, Philadelphia, Pa., on "Some Abscesses of Dental Origin which Open Outside the Mouth."

[This paper is printed in full at page 919 of the present issue of the COSMOS.]

Discussion.

Dr. THOMAS FILLEBROWN, Boston, Mass. The importance of this subject cannot in my mind be overestimated, although it is ordinarily not sufficiently appreciated. I am in full agreement with the paper, and its coming from the source that it does is evidence of its correctness. Having read it over, I am sure that there is nothing in it with which I should differ to any extent, and it is not necessary that I should rehearse what has been said; once said, and said so well, is sufficient. For many years I have paid special attention to these subjects in teaching, but I do not think I appreciated or realized until reading the paper how generally information is lacking upon the subject. I think that Dr. Cryer has had a larger experience than myself, and yet mine has been considerable.

The writer refers to the lack of knowledge of the general surgeon in dental pathological processes. I can testify to that, as I have seen many instances in public as well as in private practice. The writer's description of the anatomy of the parts is of course beyond criticism. Any man who has had the privilege of visiting the museum of the University of Pennsylvania—the institution with which the essayist is connected—or to have been in attendance at the opening of the new Harvard medical buildings at the time of the meeting of the American Medical Association, and seen that collection, cannot doubt for a moment the thoroughness of Dr. Cryer's knowledge.

He speaks of using the radiograph considerably. I would say in regard to that that I think we ordinarily find the symptoms so pronounced that the skiagraph has not afforded very much additional knowledge, not even to those skilled in its use. There are many conditions in which it is useful—as, for instance, in locating a foreign metallic object in the body; or, if one is doubtful about the presence of a root of a tooth or a misplaced tooth, then the radiograph will

afford valuable assistance. But where there is simple inflammation or an abscess sac it would give a rather indefinite picture of the existing conditions. I think that transillumination of the mouth probably does better under these circumstances than does the X ray. Nevertheless I shall continue to use it and get what I can from it. I have experienced some of the difficulties mentioned by the writer in cases where it was very difficult to determine whether a tooth contained a living or a dead pulp. I find in such cases that it sometimes requires examinations extending over considerable length of time to reach a correct diagnosis, but ultimately, in every case, you will be able to decide correctly.

The treatment of abscesses connected with the teeth, it seems to me, varies in degree rather than in kind. An abscess in a healthy person is usually of short duration and very easy to treat, but if it be in a person of advanced age or of strumous habit, the treatment will require more time. Of course the first thing to do in the case of a devitalized pulp is to remove it, disinfect the root, and fill it. In healthy patients such a procedure will be sufficient to cure the case. But if there be a fistula, the disinfecting of the canals and filling may not be sufficient; then we must attend to the fistula and give the abscess treatment through that channel. Perhaps some disinfectant will bring about the desired result; if it does not, we should apply a caustic. So to my mind the treatment of abscesses differs only in degree. But supposing, as is sometimes the case, the tooth does not recover after such a treatment, then as the last resort extract the tooth, an operation which is quite often delayed beyond reason. The old axiom voiced by Dr. Atkinson forty years ago—viz, that "Teeth should be saved so long as there is a root to build a crown upon, or a crown to build a root upon"—does not always apply. Of course that was one of his laconic phrases, to be taken *cum grano salis*. For years, I think, our profession has run wild on that subject, and it has not become quite sane yet.

A few years ago a Dr. Sexton, in New

York, raised the question that too much was done in the way of saving teeth, to the injury of other organs, especially the ear. Dr. Abbott, I remember, had a good deal to say on this subject, and ridiculed Dr. Sexton's idea. Now, I want to make one observation that bears out the statement of Dr. Sexton as to the relations existing between the teeth and the eye, ear, and throat—the latter group depending so much upon each other, and each being dependent upon the condition of the teeth. I believe that many teeth have been saved long after their usefulness had gone and when injurious effects were well established. In my own practice, years ago, I treated a bicuspid having a devitalized pulp, which I filled in good shape, and I did not discover that the tooth was not all right. The patient had trouble with the left eye; there was a condition of inflammation there, and he could not get it cured or find what was causing it. Finally it was surmised that the tooth might have caused the trouble, and I extracted it, when the eye immediately got well and remained so. And so also I have known of trouble occurring in the ear caused by diseased teeth.

I remember reading the case of an abscess from a third molar in which the pus had burrowed its way down under the fascia and discharged on the breast as low as the fifth rib. It was that of a lady patient who had sought the services of a Paris dentist for the repair of an artificial denture. While she was in the chair his attention was called to this discharge from the breast. By examination of the mouth it was found that there remained a root of a third molar which had caused an abscess. The extraction of that root brought about a cure in a short time.

Another case was reported in which the abscess discharged on the back of the neck; another, low down on the scapula; and we know of many which have discharged on the cheek. I remember one case in which there was a discharge from an upper molar, evidently, but the point of discharge was above the apex of the roots. It seems that the pus had worked

up to the floor of the antrum, lifting the lining membrane, and had then followed a backward course to the parotid gland, forming a fistula which opened on the cheek nearly two inches from the origin of the abscess; that was proved by the passing of a probe. This case was cured, after a few weeks' treatment, by passing into the fistula a tent of cotton saturated with carbolic acid.

The discharge of abscesses beneath the angle of the mandible and into the glandular region of the neck is too familiar to all to need more than mere mention. I remember another case where the discharge was on the right side of the mandible, opposite the first molar. The case was operated on twice for necrosis—the face had been opened up, and the bone cut away. I examined the case and found a molar root that I felt confident was the cause of the trouble; the root was removed, and the patient recovered immediately. Abscesses of the upper canine discharging at the outer or inner canthus of the eye have repeatedly, while in the active inflammatory stages, been treated by the general practitioner of medicine as erysipelas. Abscesses of the upper lateral incisors give rise to serious conditions very difficult to remove. As has been described in the paper, the pus separates the plates of the palate bones, forming a cavity extending often as far back as the third molar. One such case I had which I could not cure until I chanced to find that an unsuspected bicuspid was involved, and had the tooth removed. I reported the case before a dental society, and one of the members sharply criticized me for not diagnosing the trouble as being in the antrum. The treatment of the case proved that I was correct.

Another case to illustrate the knowledge of the general surgeon on dental lesions: A patient came under my observation after two operations had been performed for pyemia of the antrum; the diagnosis implied that the patient could never recover. An examination was made by a dentist, who found that there were eight roots on that side of the mouth, most of them the seat of abscesses. Later these

roots were removed, and of course it was discovered that the area was filled with pus discharging into the antrum. The man was a stair-builder, and the prognosis of the general surgeon was that he would never be able to do anything more at his business, as he would never get well. In ten days after the removal of the roots the man was going about his business, and seemed comfortable.

The most serious condition is when the abscess discharges into the ethmoidal and sphenoidal cavities. The cavities are large, their walls are very thin, and they extend quite close to the brain. If pus enters these cavities a constant discharge from the nose may result, which is incurable until the offending tooth is removed, or the pus may work backward until the brain is reached and—as has been the case—so cause the death of the patient.

In closing, I would commend the paper to your attention and to your memory. A study of this paper in reference to cases of this kind will be of permanent value to you.

Dr. CRYER (closing the discussion). I am exceedingly grateful to Dr. Fillebrown for his kind remarks in regard to my paper. I wish, however, we might have heard more of his views on those diseases of the maxillary and frontal sinuses and the ethmoidal cells which arise from diseased conditions of the teeth, because I am aware of his familiarity with this subject.

There is only one point on which we differed, namely, the use of the X ray in the examination of the internal portion of the face. Several years ago I was of the same opinion as Dr. Fillebrown, and at one of the meetings of the Academy of Stomatology of Philadelphia, after a long discussion on the use of the X ray in regard to the diagnosis of impacted teeth, I am reported as having said, "Today, if I had a case of an impacted tooth, I would depend on a good sharp excavator rather than the X ray." When I made this remark the radiographer had not made such wonderful progress, and X-ray pictures did not delineate as they do today—October 19, 1906. When I was last

in Europe (in 1903) my attention was drawn to the scientific value of the X-ray examinations, showing not only the teeth in typical and atypical positions, but also the condition and shape of the cells and sinuses of the face. Here in Boston, at the meeting of the American Medical Association, many beautiful radiographs were exhibited in the various sections, and also at the meeting of the Massachusetts Dental Society.

I have a few plates to which I would like to refer which would have shown to advantage on a screen had there been a lantern and sufficient time.

The first is an X-ray picture showing a lateral view of the face. There is an impacted upper third molar. The greater portion of the tooth is above the level of the floor of the nose. The radiograph also shows around the tooth a cystic wall or capsule. In an antero-posterior view of the same face, taken with the plate in front of the face and the tube back of the head on a line a little below the occiput, a good opportunity is afforded for the examination of the internal portion of the face, the maxillary sinus, the nasal septum, the inferior, middle, and superior meati of the nose, and above these the ethmoidal cells and frontal sinuses. The impacted molar is also shown, and by using the two plates a nearly exact position is obtained. On the right side the maxillary and frontal sinuses and the ethmoidal cells are clouded when compared with those on the left—showing an infected condition on the side where the tooth is impacted.

The second is a radiograph taken antero-posteriorly, and shows a cloudiness in the region of the maxillary and frontal sinuses of the right side. This condition was brought about by an infected tooth. The tooth was extracted, the sinuses properly treated, and when another X-ray examination was made it showed that the sinuses had cleared and were in the same condition as those of the left side.

The third is another antero-posterior radiograph, and is the one spoken of in the paper. It shows that artificial crowns had been placed on the roots of the cen-

tral and lateral incisors, with metal pins passing into the root-canals. It also shows the changed condition of the bone above these teeth. The plate forming the floor of the nose on the right side is pushed upward by pressure the result of the infection from the teeth until the plate comes in contact with the inferior turbinated bone. I could go on showing you many slides of this character, but these are sufficient to illustrate the advance in X-ray examinations in the last few years.

Motion was made and carried to adjourn until Friday morning at 11 o'clock.

FRIDAY—*Morning Session.*

The meeting was called to order by the president, Dr. Barrett, at 12 o'clock Friday morning.

After the consideration of several business routine matters,

Dr. MURLESS introduced the following resolution, to be acted upon finally at the next annual session as an amendment to the by-laws:

RESOLVED, That no dentist or physician who is not a member in good standing of his own local society shall present a paper or clinic before this association.

Dr. Boardman moved that the committee appointed to draft resolutions on the death of Drs. Clapp and Davenport present their report to the secretary, and that it be printed in the proceedings.

The motion was carried.

REPORT OF COMMITTEE ON JOURNAL.

The President then called for the report of the Committee on Journal.

Dr. RODGERS, chairman, reported as follows:

The Committee on Journal appointed last year was composed of Dr. Maxfield, Dr. Rosenbluth, secretary, and myself as chairman. During the year we received an invitation from the Institute of Stomatology to come to New York and confer with them regarding a new journal. We there met the representatives from the Institute of Stomatology, the American Academy of Dental Science, and the Harvard Odontological So-

ciety. The question of a new journal was discussed, and it was decided to inaugurate a new journal to represent the various societies; but we felt that our committee should comply with the resolution passed providing for the committee, which was that the committee meet with a committee of the National Dental Association to confer upon this subject. These societies did not represent the National Dental Association, and therefore we could not act with them. We were in sympathy with the movement for a new journal, but we had no power to act.

During the year the committee wrote letters to different members of the National Dental Association regarding this matter, but could make no progress whatever, and therefore we have accomplished nothing. There seems, however, to be something in the air with reference to the National Dental Association taking over the journal of the Institute of Stomatology and the other societies next year.

The report was on motion received.

Dr. Barrett appointed as the committee provided for in the report of the Committee on the President's Address the following: Drs. L. D. Shepard, Boston, Mass.; James McManus, Hartford, Conn.; D. F. Keefe, Providence, R. I.; Thomas Mound, Rutland, Vt.; A. J. Sawyer, Manchester, N. H., and T. E. Tibbetts, Rockland, Me.

REPORT OF NOMINATING COMMITTEE.

The next order of business was the report of the Nominating Committee.

Dr. MAXFIELD, chairman, presented the report of the committee as follows:

President—Dr. F. E. Maxfield, Bangor, Me.

First Vice-president—Dr. E. B. Griffith, Bridgeport, Conn.

Second Vice-president—Dr. N. A. Stanley, New Bedford, Mass.

Secretary—Dr. E. O. Kinsman, Cambridge, Mass.

Assistant Secretary—Dr. Charles F. Krepel, Forest Hills, Mass.

Treasurer—Dr. F. T. Murlless, Jr., Windsor Locks, Conn.

Librarian—Dr. C. H. Riggs, Hartford, Conn.

Editor—Dr. David Manson, Burlington, Vt.

The above report was signed by Drs. G. A. Maxfield, and W. E. Boardman.

Dr. CHARLES McMANUS, the third member of the committee, presented the following as the minority report of the Nominating Committee:

President—Dr. J. E. Power, Providence, R. I.

[Other nominations as majority report.]

Dr. L. D. Shepard moved that both reports be received.

The motion was carried.

Dr. Boardman moved that the association proceed to ballot for the office of president.

The motion was carried.

The secretary and treasurer were appointed as tellers, and the result of the ballot showed the election of Dr. F. E. Maxfield, Bangor, Me., as president for the coming year.

Dr. Power moved that the vote be made unanimous.

The motion was carried.

Dr. BOARDMAN. In view of the fact that the report of the committee is unanimous for the rest of the officers, I ask unanimous consent that the rules be suspended, and the secretary be empowered to cast one ballot for the other nominees.

The motion was carried, and the secretary cast one ballot for the remaining officers.

The new president, Dr. Maxfield, was conducted to the chair, and the retiring president, Dr. Barrett, in presenting him to the society, spoke as follows:

Dr. BARRETT. You have been chosen by the members of the Northeastern Dental Association as their president for the coming year, and in handing you this gavel I hand you the emblem of authority, which should be used with justice, firmness, and with equal rights and privileges for all members, with malice toward none, and for the best interests of the association. In turning over this office to you I desire to say to the members that, as stated in my report, I am deeply grateful for the honors, one and all, conferred upon me. I am highly appreciative of the kind attention shown me and the service rendered by the various committees during my efforts to make this meeting a success. I assure you that in relinquishing this office I shall con-

tinue as far as I am able to work for the best interests of this organization, and for you, Dr. Maxfield, I wish the same kindly treatment and co-operation which I have received at the hands of the members of this association.

Dr. MAXFIELD, in accepting the gravel, said: Members of the Northeastern Dental Association, I appreciate very highly the honor which you have conferred upon

me by choosing me as your presiding officer for the coming year, and I trust that during that period I may be able to forward the interests of the society and do credit to it as your presiding officer. I thank you very kindly for this honor.

There being no further business to come before the association, motion was made and carried to adjourn until the next annual meeting.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, November 1906.

THE First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, November 13, 1906, at the Academy of Medicine, No. 17 West Forty-third street, the president, Dr. Arthur L. Swift, in the chair.

After the transaction of routine business, the president introduced CORNELIUS G. COAKLEY, M.D., of New York, who read a paper entitled "The Diagnosis and Treatment of Antral Suppuration."

[This paper is printed in full at page 909 of the present issue of the Cosmos.]

Discussion.

Dr. T. PASSMORE BERENS. It has given me great pleasure to listen to the very able paper by Dr. Coakley. He has brought the subject before us with such completeness that he leaves but little to be said.

My own experience leads me to believe that cases of empyema of the maxillary sinus caused by diseased teeth are always of an acute variety, and of such severity as to demand immediate relief; while the cases of nasal origin, even when acute, are apt to be of a milder type; or the symptoms are apt to be masked by the symptoms of the general coryza

or grippe that is present, to such an extent that the antrum may be disregarded by the patient. It is in this latter class of patients that the disease goes on to chronicity, and may readily be complicated by odontalgia, and later even by destructive processes in the roots of the teeth. I have seen cases where the history seemed to indicate such a condition.

I agree with Dr. Coakley that a diseased tooth-root may be the cause of an infection of the antrum and thence of all of the accessory sinuses, even to such an extent as to involve the middle ear—for the middle ear may be looked on as an accessory cavity of the nose. I have seen a case in which a diseased tooth caused an acute empyema of the antrum, which in turn caused a pansinusitis on that side of the head and a mastoiditis. I mention this case to call attention to the fact that acute empyema of the antrum may be followed by most serious consequences.

Dr. Coakley has recalled to your attention the use of the transilluminating lamp and of the X ray. The transilluminating lamp is so simple, and its manipulation so easy, that it should not only be found in our armamentarium, but should be used with frequency by each one of us who has to deal with the teeth, the mouth, or the nose and its

accessory cavities. In those cases that do not readily yield to treatment, radiography should certainly be resorted to. Dr. Coakley's invaluable work along this line has proved beyond question the importance of the method.

The treatment of empyema of the antrum of Highmore must necessarily be surgical, and modern surgery demands efficient drainage. The point of election for the drainage must obviously be determined by the etiology and the conditions found in each individual case. Should a badly diseased molar be the cause, the tooth must be extracted, and it seems to me good surgery in such a case to drain the sinus directly through the alveolar process; but I would emphasize the point made by Dr. Coakley that this drainage must be sufficiently free, and that no tube or other appliance be used to keep the cavity open other than that required to insure the necessary protection during the act of mastication. If a molar be merely suspected as being the cause of the disease, it seems to me good surgery—and it is the rule that I follow—to explore the floor of the antrum through the canine fossa, and to make this exploration so complete as to reveal a possibly protruding diseased root. It seems to me that by this exploratory incision we secure good drainage, and have always the possibility of saving a tooth, or even teeth. Should the case be of nasal origin, drainage through the inferior meatus should be the method of election.

To recapitulate: Cases of doubtful etiology should be explored by way of the canine fossa; cases of nasal origin should be treated through the nose, and cases purely of dental origin should be treated through the alveolus. The subject of treatment of chronic cases is too extensive to warrant undertaking its discussion at this late hour.

Dr. L. A. COFFIN. I feel myself especially fortunate in being here tonight, not only to hear this excellent paper by Dr. Coakley, which is so exhaustive, but also to hear the dentist's side of the question, which I have never been able to do, except while in position in the

dental chair, and then of course I had to listen.

For the most part we must agree with what has been said by Dr. Coakley. One point which he made is worthy of emphasis; that is, in regard to the differentiation between cases that arise from or have their origin in a bad tooth, and those of nasal origin. As Dr. Coakley states, there is a more pronounced swelling in cases of dental origin centered over the alveolar process, whereas the swelling of the cheek from antrum disease of nasal origin is less marked and more diffused.

Dr. Coakley has said that transillumination is unsatisfactory in children. This is for the reason that before the permanent teeth come down they occupy a position in front of the antrum, and of course cause an opacity in it. In fact, in infants there is no intra-orbital antral cavity, notwithstanding the fact that good men have written papers on treating empyema in the antra of infants only a few weeks old, and have told about putting tubes into the cavity and draining it into the nose. Of course you as dentists know that this is not possible. You know that the tooth-sockets extend to the floor of the orbit. We see the condition spoken of by Dr. Coakley in children in cases where there is an abscess between the bone and the periosteum, extending all over one side of the face and frequently breaking out just below the eye. These cases generally have an abscessed tooth-socket. In fact, my own conviction is that in the majority of cases the disease begins in a tooth-socket.

As to the order of procedure in diagnosis, I do not think it worth while to get an X-ray picture before diagnosing or treating a diseased antrum.

Dr. Coakley recommends the most careful inspection, transillumination, and radiography, and then, if there should be sufficient presumptive evidence, irrigation. He states farther on in his paper that there is no positive means of diagnosis except by irrigation, and further states that this procedure is painless and harmless. With this I thoroughly agree, and therefore if sus-

picious of antrum disease I at once irrigate the sinus. If pus is expelled the diagnosis is clear, and sometimes even after beginning treatment I may have the case radiographed, especially if I feel that the other sinuses may be diseased.

In regard to the extension of the disease from one sinus to another, the antrum as a rule is affected if the frontal sinus is diseased. The extension is by gravity. Dr. Coakley speaks of the extension from the antrum to the other sinuses as due to proximity, and to being separated by thin walls. This undoubtedly is true, but the infection probably takes place quite as frequently by being forced into the frontal and ethmoidal sinuses when the nose is blown. Drainage from these sinuses is generally abnormally poor under conditions such as we are considering, and consequently favors their infection.

Treatment, of course, will vary according to the chronicity of the case—that it to say, as to how acute or how chronic it is. To me a chronic case is one in which the mucous membrane of the antrum has lost its function, and varies with the length of time it has been diseased and with the virulence of the infection.

Dr. Coakley says the antrum is kept dry by the absorption of moisture by the air as it passes over the ostium of the antrum. With this I must disagree. The normal ostium—or the opening into the antrum—is not much larger than the head of a pin, and the antrum is a pretty good size cavity. The mucus contains much moisture. If it were dried out by warm air flowing over the ostium there would be a residue. But such is not the case. The mucous membrane being covered by ciliated epithelium, constantly moves the mucus toward the ostium, and assists in throwing it from the cavity. This leads to the matter of treatment in acute cases. One reason why dentists so frequently get such good results in treating diseased antra, I think, is because they interfere so little with the mucous membrane. Of course the cause should be removed whenever it can be found. If it be a diseased tooth it is easily done.

Dr. Coakley advises a large opening through the naso-antral wall in the region of the inferior meatus, as performed by most rhinologists. Now we have a way of thinking that the antrum is poorly constructed, as we might criticize the work of one who was not quite up on mechanics and architecture; but, as a matter of fact, it is beautifully and wonderfully done.

True, the ostium is frequently at the highest point, but of course the head is constantly occupying different positions, and then we have that constant oscillating motion of the cilia, and these two conditions afford a well-drained cavity. If it were a fact that the drainage from the antrum is as poor as we sometimes think, we should have diseased antra much more frequently than is the case.

The proper treatment for the acute case—and the acute case is the one in which the function of the mucous membrane has not been destroyed—is to help nature as much as we can by doing just as little damage to the walls of that antrum as possible. I should prefer to use the trocar and cannula for two or three weeks in an effort to effect a cure, rather than to make a large opening as the first step in the treatment. But when it comes to the chronic case, in which the membrane has ceased to functionate and is beyond repair, there is nothing for it but to make the large openings, and to curette out the cavity as described by Dr. Coakley, leaving the large opening in the inferior meatus for drainage.

Obliteration of the cavity by granulation is such a tedious and long-drawn-out procedure that it is not much used.

Dr. HUBBARD. I think the rhinologists have had quite enough to say upon this subject, and the dentists should now have their chance.

Recent experience leads me to mention the fact that in irrigating the antrum great care should be taken lest the retained fluid find its way into the nasopharynx; and there the largest part of the fluid is likely to cool, and thereby set up otitis. This has occurred in my own practice. Great care should be taken to hold the head well forward, so

that the fluid does not flow over posteriorly, since the position is such as would favor the running of the fluid in that direction. It is quite an important phase in preliminary irrigation to prevent the occurrence of acute otitis. As we know, the constant use of the nasal douche will also set up a subacute inflammation in the middle ear.

I would criticize Dr. Coakley's alveolar surgery in that he would establish such a large opening through the alveolus, not smaller than the crown of the tooth removed. I really see no object in that, for if the case is such that it is necessary to use a curette, it had much better be done through the canine fossa. I believe a small opening through the alveolus is to be preferred in simple cases, and only when the case does not readily yield to treatment should the more radical method be resorted to.

In closing, I would like to ask Dr. Coakley to give us some idea of the length of time required for the formation of granulation tissue in the antrum, as the result of retained pus there, requiring the radical operation of removal through the large opening in the canine fossa; whether it is possible, in the course of a week or so, for granulation tissue to form which cannot be cured by simple irrigation or removal of the offending cause.

Dr. M. I. SCHAMBERG. I deem it an honor and a pleasure to be one of those asked to open the discussion of Dr. Coakley's paper. Your committee deserves much credit for having selected and secured as the essayist of the evening a man so well qualified to deal with the subject under consideration. In no other way can so much good be accomplished in arriving at the true etiology of diseases of the maxillary sinuses as by bringing together, as you have this evening, in friendly discourse, the rhinologist and the stomatologist. Thus far you have heard the experiences and opinions of the eminent guests of the evening who, through their thorough familiarity with the nasal chamber and its diseases, have enlightened us as to the frequency with which antra are involved secondarily to

nasal affections. It must be evident to all present that when we have solved the question as to the cause of an antral infection, the treatment in a measure will suggest itself. If a patient is suffering from a hypertrophic rhinitis, causing a stricture of the ostium maxillare, the nasal mucous membrane must be restored to a fairly healthy condition before it can be safely said that the extensions of the Schneiderian membrane which line the associated sinuses are free from pathological change. When either the ethmoidal or frontal sinuses are the seat of a suppurative process, the antra are in imminent danger of infection. The excellent work in connection with the anatomy of these parts conducted by Zuckerkandl, Cryer, and others clearly demonstrates the manner in which the frontal and maxillary sinuses may infect one another through the medium of the infundibulum and the hiatus semilunaris. Following attacks of influenza and other maladies in which catarrhal symptoms of the nasal chamber are manifest, secondary infection of the sinuses of the face is not an infrequent sequence. In all such cases the resultant antral empyema is best handled, and the parts more quickly restored to the normal, by treatment at the hands of the rhinologist.

Dr. Coakley was correct in his surmise when he prefaced his remarks on etiology by saying "Your clinical experience and ours will probably differ materially." The estimate which the essayist gave, that less than twenty per cent. of the cases of maxillary sinusitis that came under his care were of dental origin, makes me hesitate about stating the proportion of cases which I believe to be of nasal origin. It is natural that each specialist in his own sphere should attract to him mainly such patients as are suffering from ailments originating within the organs under his supervision. Until I had the opportunity of learning Dr. Coakley's views on the subject, I will admit, owing to the large number of cases of sinusitis that have come before me, evidently of dental origin, that I believe fully ninety-five per cent. of all suppurative antral affections could

be directly charged to infections emanating from the mouth. It was my belief that only rarely was antral empyema due to nasal infection, and that mucous engorgement was the more frequent concomitant to an inflammatory condition of the nasal mucous membrane. There are within my recollection only two or three cases which have come under my care where the teeth and mouth could be absolutely excluded as the cause of the antral disturbance. In one of them I punctured the nasal wall through the inferior meatus, and though excellent drainage was secured, and an opportunity for antral irrigation afforded, my failure to re-establish the normal opening in the middle meatus caused me to turn the patient over to a rhinologist for removal of polypoid growths which were retarding the recovery of the case.

In Philadelphia about one-third of my antral cases were sent to me by rhinologists, and two-thirds by practitioners of dentistry. The fact that so many more cases came to me from rhinologists than I was able to refer to them influenced me to believe that antral trouble is more frequently a dental than a nasal disease. Strong evidence indicating the nasal origin of antral affections was brought out by Dr. Coakley in his reference to the fifty-nine cases treated at the Bellevue Hospital Clinic, all but four of which were cured without any attention to the teeth. The value of that observation lies in the fact that if the teeth were the primal cause of the trouble, no treatment save that which was directed at the cause would bring about a permanent result.

With this thought in mind, permit me to emphasize the fact that in my opinion no abscessed condition of the antrum due to disease about the end of the root of a tooth can be absolutely cured until the tooth or part of the tooth causing the trouble is removed. Through the opening thus established, irrigation and drainage of the antrum is best accomplished. This affords an opportunity to enlarge the opening in order to remove all the affected bone at that point. Only where the cause of the trouble cannot be

located is it advisable to select as a point for entrance the most dependent part of the cavity, or the place where the wall is thinnest. Rubber drainage tubes are to be deprecated, for the reasons mentioned by the essayist. In exceptional cases of the chronic type, where the antrum has been bathed in pus for a long period, and it is well to keep the cavity open for some time, it may become necessary to construct a gold tube to be worn by the patient, securely attached to one or more teeth. Iodoform gauze in other cases may serve as an antiseptic plug, and will maintain the opening, but offers little opportunity for continuous drainage. I do not believe in treating the antrum through an opening so minute as the pulp-canal of a tooth. On the other hand, I do condemn the unwarranted sacrifice of teeth which have been suspected but not actually found to be the cause of the trouble.

The essayist has properly called attention to the value of radiography in determining with a marked degree of accuracy the causes of antral involvement. I wish to supplement what he said by stating that the X ray has been invaluable to me in determining with precision the exact seat of the primary infection about the floor of antra.

In cases of antral disease in which it is desirable to save the affected tooth, it can be accomplished by making the opening in such a way that the end of the tooth is cut off at the same time that the antrum is afforded its drainage.

Dr. Coakley's reference to the many cases of antral disease secondary to nasal trouble, leads me to the belief that there is greater liability to reinfection of the antrum from an opening made by puncture through the inferior meatus of the nose than there is when the antrum is drained through the mouth. If the cause be a much diseased tooth, its removal will afford the best means for draining an infected antrum. The mouth is by no means more sterile than the nose, but the nose being so frequently the seat of a catarrhal inflammation, the mouth appeals to me as the best site for the puncture.

I have brought with me—but will not take up the time to describe them—some slides showing the floor of the antrum in a variety of cases of its infection from suppurative conditions about the teeth. In all these cases, the first thought must be the removal of the cause. Irrigation of the antrum should follow, and I believe that in most cases, where there has been an infection from the mouth, bland antiseptics are to be preferred to the saline solution.

Dr. Coakley has modestly requested in his paper that we present the dental standpoint, so that he might be benefited by our views. We feel grateful to him for what we have learned from his paper of antral affections originating in the nose, and I believe most infections from the nose are of a mild type. The majority of cases originating from diseased teeth present the conditions that are found in alveolar abscesses. The antrum becomes a bone-abscess cavity, and I question whether a saline solution injected into that cavity is sufficient to thoroughly remove the irritating influence of pyogenic organisms.

There is another reason why I would recommend bland antiseptics in preference to saline solution, in that frequently, especially where openings are not made in the dependent portion of the antrum, a small amount of the solution remains for a brief period, and a normal saline solution, which simulates the blood, is more likely to be a favorable medium for the growth of bacteria than is an antiseptic.

Dr. ALFRED R. STARR. I think from experience that the great majority of antral cases are of dental origin.

We have one advantage over the rhinologists and other specialists in the manner in which we treat these cases and in the certainty of our diagnoses. Starting presumably from a diseased tooth, the method of procedure is to remove that tooth, and make an opening through the socket. I have seen quite a few cases in which, after opening the maxillary sinus, to the operator's surprise no pus escaped; but from the very nature of the operation, the manner in which it was

performed, and possibly through lack of proper antiseptic precautions, the dentist, after twenty-four or forty-eight hours, almost invariably has found his diagnosis of empyema of the maxillary sinus to be the correct one.

In reply to the question asked by the essayist in regard to the dental origin of this affection, it is my belief that we could have abscessed areas from other conditions, such as foreign deposits about the teeth, which abscesses might possibly penetrate the antrum and set up this condition; but in the great majority of cases, I believe we must have a diseased tooth—or to be more definite, a true alveolar abscess—in order to cause the empyema of the maxillary sinus.

In regard to the question as to whether such a tooth could be treated and saved, and at the same time the antral condition be gotten rid of, I believe it to be possible in certain cases; but as a rule the conditions call for more radical treatment and for the extraction of the tooth.

I recall one case of antral empyema in which the pus escaped from quite a large opening posterior to the canine fossa, above the roots of the first and second molars. By passing an instrument along the floor of the antrum I could feel the buccal roots of the second molar projecting into the cavity. I then drilled into the second molar, which was devitalized, and found that the root-canals had been filled.

Thinking that possibly these projecting roots were the cause of the trouble, and being unable to thoroughly remove the root-filling from the interior of the root-canals, I amputated the projecting portion of the buccal roots, and requested the patient to return in order that I might follow up the case and ascertain what became of it. Unfortunately, I lost track of the patient, and am not able to tell what the consequences were.

In another case there was a slight empyema of the sinus, which drained through the open lingual canal of a first molar. The patient was a physician and took care of the case himself, washing

out the canal daily, and putting antiseptic dressings loosely in the tooth. After several months the discharge ceased—or became so slight as to be unnoticeable. The lingual root-canal—the only open one—was then closed. Six months or more have elapsed without the patient noticing any return of the trouble.

Dr. HERBERT L. WHEELER. The experience of several years, during which time I was more or less intimately associated with some rhinologists in Worcester, Mass., where I practiced for some years, leads me to believe that Dr. Coakley's statement that probably a majority of the cases are not of dental origin is correct.

I came to the conclusion, after having had occasion to examine or treat fifteen or twenty cases in the course of four or five years, that where the case is of dental origin, if it be not too far advanced in the acute stage, the removal of the cause and the treatment of the root-canal as you would an ordinary alveolar abscess, and the treatment of the inflamed condition of the mucous membrane of the antral cavity by the rhinologist through the nose, will bring about quite as good, or better results, than would the extraction of the tooth.

If, on the other hand, the case is a chronic one, and the membrane covering the root and the muco-periosteum of the antral cavity are seriously affected, I have never succeeded in obtaining good results without extracting the tooth.

I devised and used for some time a tube made of platinum, for I think that tissues tolerate platinum better than they do gold.

Dr. NELSON T. SHIELDS. My experience in the treatment of antral cases has been invariably that they were caused by the teeth, and in answer to Dr. Coakley's question as to whether it would be advisable to treat the trouble through the canine fossa and allow the diseased molar or bicuspid to remain, I would with a great deal of emphasis state that it would be a very serious error to allow such a tooth to remain.

You might excise the buccal portion of a molar, and flatter yourself that you

have induced a healthy condition, but under the end of that root there would, to my mind, still be cause for a possible irritation.

I have used with satisfaction in the treatment of such cases Dobell's solution—a simple antiseptic, and the most soothing and healing solution that you can employ for any disease of the mucous membrane.

Dr. COAKLEY. I certainly feel very grateful for the kindly reception of my paper, and for the criticism on many points which some of my friends and I have discussed on previous occasions in our various rhinological meetings.

I have not always met the same unanimity of opinion as to what was best to be done in the treatment of an acute or chronic antral suppuration.

I would like to say to Dr. Shields that when an acute antral suppuration fails to respond to treatment, there is some cause for it, and that the first place in which we look for it is in the teeth, as to whether there is any likelihood of irritation being kept up by them.

I am very glad to have the question answered by Dr. Shields, that the exciting cause in antral suppuration should be removed, because occasionally I have felt a little in doubt as to whether it is possible to relieve the symptoms.

Dr. SHIELDS. May I interrupt one second? After the removal of the tooth, the space caused by the extraction should subsequently be filled in, to prevent the entrance of bacteria from the mouth.

Dr. COAKLEY. I did not quite understand Dr. Schamberg's statement as to the mouth and nose being equally full of bacteria—or whether the nose was more sterile than the mouth. I think that is not in accordance with bacteriological findings. The interior of the nose is practically free from pathogenic bacteria, and draining into it you are draining into a sterile part. The danger of infection through the nose is very small. On the other hand, you have the opening down through the mouth, which you keep open with the tube. I speak of that because it is the kind of treatment I have seen much of. I may say here

that in most of the patients who have drifted into my hands the disease had run a prolonged course, and having had these tubes in the mouth during all that time they invariably asked to have them removed, for they are a source of annoyance, after they have been worn for a few weeks even, or months or years.

Dr. LELAND C. BARRETT. May I interrupt to ask how these openings are kept free from bacteria?

Dr. COAKLEY. I did not mean to say that the nose was always in a sterile condition, because it is not sterile when acutely inflamed. You can often find pneumococci and other pathogenic organisms in the secretion in the mouth, besides many other parasites.

Dr. BARRETT. The rhinologists will admit, however, that the nasal mucous membrane is more frequently the seat of catarrhal infection than is the membrane of the mouth.

Dr. COAKLEY (closing the discussion). It is, but many of these cases are the result of general pathological conditions—a gradual hypertrophic process, not a bacterial infection. We do not regard them as such.

The matter of antiseptic solutions is one about which I feel quite strongly, Mr. President, and if time permits I would like to say a word about them.

We formerly used strong solutions, and later started to employ milder ones; now we practically use no antiseptic solution at all. You can try that on yourselves very easily. If you spray the mucous membrane of the nose with an antiseptic solution it will smart and burn; if you do it with a normal saline solution containing a small amount of an alkali—sodium bicarbonate—practically it will not smart at all. Smarting produces hyperemia, and anything that tends to increase the hyperemia is inadvisable to use. There is no necessity for irrigating the antrum if you have made the right kind of opening.

Take the average case, having a foul discharge coming down into the mouth. One or two saline irrigations will remove all of the foul discharge, and thus free the patient of the most disagreeable symptom. If there is a diseased tooth

in the upper jaw, there will be a continual foul discharge. I have always found it so.

It is not necessary to irrigate an antrum. The discharge will take care of itself, and it is no more necessary to wash out the antrum than it would be to wash out the nose. It will drain of itself, and do better, as a great many believe, without any irrigation whatever. The day of irrigation has gone by. The surgeon cares nothing about that. He does not care if there be pus around the wound. He just lets it alone, and the less he disturbs his granulations, the quicker and the better will be the healing.

Ten years ago, in mastoid surgery, every time it was dressed the wound was irrigated; granulations were abundant and excessive, and had to be cut away or cauterized, and it took a much longer time to induce healing. Now the surgeon removes the old dressing after it has been in place four or five days, and puts on a fresh one without irrigating the wound. I know from a considerable experience, with and without washing, that many sinuses recover sooner without irrigation than they would had it been employed.

Dobell's solution is a very mild one. The only thing irritating is the carbolic acid which it contains. It is not antiseptic. It is not any more antiseptic than a bland normal saline solution.

Do not wash the sinuses; let them alone, give them good drainage, and they will get well sooner and more satisfactorily.

As to the question Dr. Hubbard asked. I have opened up antra—when I used to open up the acute cases—widely through the canine fossa, much more widely than I subsequently found necessary, and I was surprised to see how quickly great masses of edematous membrane formed. When you have a large opening, in a little while absorption takes place, and they disappear entirely.

A hearty vote of thanks was tendered to the essayist and the gentlemen who discussed the paper, after which the meeting adjourned.

B. C. NASH, *Secretary*.

SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

Thirty-eighth Annual Union Convention.

(Continued from page 740.)

TUESDAY—*Afternoon Session.*

THE meeting was called to order at 2 o'clock P.M. by the president, Dr. Robinson.

A paper was read by Dr. J. A. SHERWOOD, Buffalo, N. Y., on "Porcelain Crown and Bridge Work."

After the discussion which it elicited the meeting adjourned.

Evening Session.

The meeting was called to order by the president, Dr. Robinson, at 8 o'clock P.M.

The first order of business was the reading of a paper by MARSHALL CLINTON, M.D., Buffalo, N. Y., on "The Early Diagnosis of Cancer."

[This paper was printed in full at page 726 of the July issue of the COSMOS.]

Discussion.

Dr. I. L. M. WAUGH, Buffalo. I do not believe that the dental surgeon comes sufficiently in contact with these growths after they have become malignant to afford any material education along the line of detecting or differentiating between malignant and benign tumors. I believe with Dr. Clinton, that where a growth is judged to be cancer the irritating cause should be removed at once, and that all growths in the mouth should be watched—and Dr. Clinton goes so far as to say that they should be removed. I have watched these growths carefully, and if there is any observed tendency to their spreading to the surrounding tissues, I immediately send the patient to a specialist. I have heard dis-

cussions at various times on the diagnosis of cancer, but it seems to me that these are so infrequently met with by the dentist that he cannot diagnose them. We should, however, watch these growths in the mouth, and try to determine if there is a spreading to the surrounding tissues, and in that case we should send them to someone who is capable of diagnosing the case. I recall many young practitioners who have laid the foundations of their practices by sending such patients to physicians after other dentists had forgotten to pay attention to these growths. In one case I remember a lady in whose mouth there was a growth which was viewed with suspicion by the dentist. She was promptly sent to a surgeon, and it was found to be carcinoma. Several operations were performed, and the patient was made comfortable for a period of years afterward before succumbing to the disease. I have no doubt but that in many cases we may perform valuable service to patients by watching these growths, and sending the cases to some expert in cancer troubles.

Dr. H. B. HUYER, Buffalo. I wish to congratulate the gentleman on the paper. I am sorry Dr. Crawford is not here, because it is a chance for the medical men to get back at him for what he said this afternoon; for while physicians are lax in sending fractures to dentists, dentists are equally lax in regard to the work under consideration. The only hope of relieving a cancer patient, at least temporarily, is by discovering the presence of the growth as early as possible. We know that in these cases, if we can apply treatment quickly enough, before undue growth has taken

place, it can be eradicated. One thing that Dr. Clinton did not mention, particularly in reference to these growths, is with reference to the use of the microscope in the study of small sections of the tissues that are suspected. It is my practice with a suspected growth to cut a section and study it under the microscope, and, taking it together with other symptoms of cancer, establish a diagnosis. When these symptoms have not gone too far you can usually make the patient comfortable, this depending of course on the severity of the case. I would like to emphasize the point of the essayist that we should look upon every one of these conditions with suspicion.

Dr. WAUGH. Dr. Huver said that we as dentists should take these sections and study them. I wonder how many dentists or general practitioners there are who would know a morbid growth, either cancer or sarcoma, when seen under the microscope.

Dr. HUVER. Dr. Waugh misunderstood my meaning. I never depend on my own judgment. These sections should be taken and put in the hands of men who know—men who are experts in diagnosing these conditions by means of the microscope. We have very few whom I think we could rely upon, but we have in Buffalo better facilities for this work than in any city in the country. I know that Dr. Clinton, when he is suspicious of the character of a growth, does not attempt to make a diagnosis himself, but simply takes a section of the tissue and submits it to some of our experts.

Dr. T. C. PHILLIPS, Buffalo. I am glad to have heard Dr. Clinton's paper this evening, and I think it is a subject that should be impressed upon our minds very forcibly. We have the opportunity, not only of saving teeth, but of saving lives, and I think that this paper is a very valuable one. The essayist should certainly be congratulated upon the result of his efforts.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I did not understand the purport of the remarks of the speaker who referred to me. If he thought that I intended or that I wanted to do the regular practitioner

any injustice, I dissent from that view. I did assert, and do still, that the ordinary practitioners of medicine do not know any more about the treatment of maxillary fractures than common laymen. They, however, are not to blame for that, and I am going to put the blame where it belongs—with the dental profession. We are responsible for their ignorance, and it is due to the fact that in every medical institution in this country with which I am familiar, the whole range of pedagogical science—the science of teaching in all its departments, literary, scientific, professional—does not embody anything bearing on dental surgery. It should not be embodied for the purpose of teaching general practitioners how to practice dentistry, but to teach them what they should know about dentistry. If I could succeed in arousing sufficient agitation concerning the subject as to lead to the establishment in the medical schools of a chair on dental surgery, I should have accomplished more than any man who has lived in the past twenty-five years. I take the position that the dental surgeon should perform every operation upon the mouth and face, even to the resection of the entire jaw; not only that, but in my opinion he could do it better than anybody else. Rhinologists claim that diseases of the antrum belong to the province of the rhinologist, yet every dentist knows that at least seventy-five per cent. of the cases are of dental origin, and still you cannot induce medical men or rhinologists to admit this fact.

Regarding the subject of the microscope in differentiating between malignant and benign affections: While I do not want to ignore or decry the value of microscopical work, yet so far as my study has enabled me to go, it seems to me now that the position of the microscope in reference to the question of physical diagnosis is now simply that of a help; that it is not absolute in its findings, which should be viewed only as corroborative of the previously conceived knowledge based upon rational clinical observation. Now, the dental

surgeon has an advantage over the general practitioner in being able to utilize one of the most valuable laws in physical diagnosis, that of exclusion. All practitioners admit the force of the statement that one of the best laws in diagnosis is that of exclusion.

You may go out from here next week and obtain sections from mouths in another community, and you would be astonished at the number of cases of sarcomatous affections you would find. You may go still farther into another community, obtain sections and examine them under the microscope, and you could then see to your own satisfaction that the microscope is not absolutely demonstrative, that it is simply an aid to the surgeon. While I do not wish to decry the value of the microscope as an aid in diagnosing conditions, I would rather have the opinion of a great physical diagnostician who has developed the powers of diagnosis as the result of long study and clinical observation, than all the microscopes in the world. There is use for the microscope, and we want to take advantage of its value in this work, but when specimens are examined they want to be sent to experts for this purpose. This is a very interesting field, especially to the dental surgeon, and while I would not desire to change the course of the discussion, we see many affections that may be readily diagnosed by a dental surgeon that seem very complicated to the general practitioner. I refer to many of the common dental maladies we have, as for instance the ordinary condition of septic pericementitis following the death of the pulp. Many times we have seen the jaw enlarged, and the external plate of the bone considerably bulged outwardly more often in the maxilla than in the mandible. If you take a case of that kind and submit it to the ordinary process of differentiation by the regular practitioner, the chances are that he will pronounce it septic sarcoma. If that is the case, four millions of people in the United States have that disease today. This condition is a very simple one for the dentist to treat, but the simplicity

of the treatment is not always in proportion to the severity of the disease, although I think it is of all the conditions that come under our observation the easiest one to diagnose. That bulging of the jaw, although a very common pathological condition, is more frequently diagnosed as a malignant form of tumor than any other condition.

Dr. S. ESCHELMAN, Buffalo. I would like to say a word or two in relation to this subject. First, I would like to emphasize the point brought out by Dr. Clinton as to the importance of taking the necessary care of those apparently minor diseased conditions of the mouth. I believe that we should endeavor to cure them as soon as we find them. The other point I wish to make is in regard to the microscope as being always a positive means of diagnosis. The reason I bring out this point is that a few weeks ago a patient came to my office with the cheek bulging out, and the upper alveolar process in the left side so enlarged that it extended half-way over the median line. I examined the case, and calling aside the nurse who was attending the patient, told her that the patient had a malignant growth, and that the sooner she consulted a rhinologist the better. I called up the lady's husband and told him that his wife had a malignant growth in her mouth. She was sent to a rhinologist, who made some scrapings and had them examined under the microscope; they showed that "there was only an intense inflammation there," and nothing further was done. The last I heard of the case was that a specialist, who had been called from Rochester, had pronounced the growth a malignant one, and that the patient could not live more than a week. That simply shows the importance of early diagnosis. If the original disturbance had been attended to earlier, there is no doubt in my mind that the patient might have been saved. This is only a suggestion, because we hear so many speak of the microscope as an invaluable aid in diagnosis; while in this case, instead of showing a malignant growth, it showed only an intense inflammation.

Dr. F. W. Low, Buffalo. I can say

that the microscope is not always a reliable means of diagnosis. I removed during my years of practice four tumors that I diagnosed as epulis, and the diagnosis had been confirmed in every instance by some member of the medical profession whom I considered competent, and all these cases recovered promptly. The physician to whom I sent the last case was out of town, and of her own volition she went to a well-known surgeon of Buffalo, and he pronounced the growth a malignant one, told the patient how dangerous the disease was, and wanted to operate at once, even before the girl left the office. She returned home very much frightened, but came back to me several days afterward and told me what the surgeon had said. I then suggested that she consult another surgeon, who this time confirmed my original diagnosis. I operated on the case, the patient recovering promptly, and since then there has been no recurrence of the growth. As the surgeon first consulted assured the patient that he had made a microscopic examination of the tissues, I therefore do not think that the microscope can be relied upon invariably.

Dr. HUVER. I do not consider the scrapings from one portion of a suspected growth, studied microscopically, as reliable means from which to form a tumor diagnosis. I believe that the tumor will force the normal tissue ahead of it, and consequently in making a scraping you will obtain only the normal tissue. To obviate this possibly misleading procedure, I think the better practice is to make several sections from different portions of the suspected growth. With reference to Dr. Crawford's remarks I will say that we are in what is known as the "cancer belt," and I do not believe there is a section of the country in which there are one-fifth as many cancer cases as are found in this section. We are doing some good work along this line, in the hospital of this city, for the treatment of that disease, and I would like very much to show Dr. Crawford the character of work we are doing.

Dr. WAUGH. I think we are right

in sending these cases to expert specialists, but I think we should hesitate in sending them to the general surgeon. The general surgeon does not give much study to these conditions of the mouth, and he is not as familiar with them as is the dental surgeon. Recently a case of abscess came under my observation, in which the delayed extraction of the second molar had caused a necrotic process. The patient was sent to the general hospital, and the case was diagnosed as one of severe necrosis. Shortly before the operation, upon being asked my opinion regarding the case, I stated that it was a simple case of necrosis, the result of alveolar abscess—although the surgeon intended to remove the entire half of the mandible from the coronoid process to the symphysis, on the supposition that it was a case of malignant growth. One of the younger surgeons present succeeded in dissuading the senior surgeon from removing the half of the mandible, and it was operated on for advanced necrosis only. Now, of course we all may err, and perhaps we are always too ready to magnify the mistakes of others, but in the face of such mistakes, with the knowledge I have of several similar ones, I would hesitate in sending these cases to the general surgeon.

Dr. CLINTON (closing the discussion). It has been my privilege for the past four years to teach surgery, and I invariably instruct the students, when called upon to treat a case of fracture of the jaw, to secure the assistance of a competent dentist, and at present the two hospitals with which I am connected in the capacity of attending surgeon, have consulting dentists on their staffs. When fractures present, the dentist treats them in conjunction with the surgeons.

There has been a rambling discussion in regard to the microscope. In the use of the microscope I do not believe there are more than five men in Buffalo competent to make a diagnosis of some kinds of cancer—that is, competent to make an absolute diagnosis on the strength of which I or any other surgeon would attempt to operate. This is a work that

requires much skill and many years of hard work, and while I am familiar with the microscope, I would not attempt to operate unless my diagnosis be confirmed by an expert in this line of work. The diagnosis of sarcoma is one of the hardest problems with which we have to deal, for the reason that certain cases of sarcoma, of the tonsil for instance, are almost absolutely impossible to diagnose.

I do not want to take up too much of your time, but I wish to impress upon you the major point of my paper, namely, that we live in the cancer belt, and that when a man reaches the age of thirty he has reached the age at which he has lessened immunity to cancer, and we want to bear in mind that cancer starts from the little growths in the face referred to in the paper. It is a common experience in our hospitals to receive cases in a very serious condition, which, had they been discovered and treated, say a year earlier, could have been saved. Today cancer, as far as we know, is an infectious disease, at least it is so apparently, and I want to emphasize the importance of removing all centers of irritation by removing these growths as early and as soon as we see them.

The next order of business as announced by the president was the reading of a paper by Dr. D. H. SQUIRE, Buffalo, on "The Making of Gold Fillings in the Approximo-Occlusal Surfaces of the Upper Bicuspid Teeth."

The subject of Dr. Squire's paper was passed, and the President announced as the next order of business a paper by Dr. C. W. LA SALLE, Rochester, N. Y., on "The Swing of the Pendulum."

There was no discussion on Dr. La Salle's paper, and the subject was passed.

The President then announced as the next order of business a paper by Dr. W. W. BELCHER, Rochester, N. Y., on "The Use of Compressed Air in the Office and Laboratory."

[This paper was printed in full at page 722 of the July issue of the Cosmos.]

Discussion.

Dr. A. P. BURKHART, Buffalo. I was very much interested in the paper, because I have experimented considerably along the lines outlined in it. Of all the appliances I have had in my outfit, none has given me and my patients more comfort than has compressed air. Among the many uses to which it can be put is in finishing a filling, to keep the tooth and metal cool. The use of compressed air for this purpose will shorten very materially the operation. I believe it can be done in this way in one-fourth the time it has taken heretofore.

Another use I have made of compressed air—and to my very great satisfaction—is in the removal of pulps. I still adhere very largely in my practice to the use of arsenic, and perhaps allow the application to remain a little longer in the teeth than many operators do, but at the appointed time, when the patient returns, I remove the temporary stopping and use compressed air along with hydrogen dioxide, which I drive into the cavity, and it fairly lifts the pulp from the canal, cleanses the latter, and enables one to remove every particle of the pulp tissue quickly. I have an electric outfit in my office, but if I were compelled to give up either, I would give up the electric outfit and hold to the compressed air.

The sprays which Dr. Belcher speaks of are very useful, and go far toward making the patient more comfortable, especially after a filling operation. Thoroughly spraying it cleans the mouth and leaves it in a pleasant condition, and the patient in a pleasant frame of mind, a source of comfort and satisfaction to both patient and operator. Like Dr. Belcher, I made the mistake of having too small a tank, and if I were to install an outfit today I would have a forty-gallon tank, instead of a twenty-gallon. The outfit can also be used in the laboratory, for soldering, etc., although I have not used it in that way. But in the uses to which I have put it in my work, it has proved itself a very useful appliance.

Dr. PHILLIPS. I would like to add one little use to which we may put the

compressed air. In placing an inlay, if the matrix does not readily come from the cavity, if you will turn the compressed-air spray on the edge of the matrix the latter will be forced out of the cavity very readily, without affecting the shape of the matrix a particle.

Dr. BELCHER (closing the discussion). When I first put in the outfit it was installed only in the laboratory, but after a year's use I had it put in the operating room; and I appreciate the satisfaction derived from its use—satisfaction which I missed for so long a while. In cleansing the teeth after an operation, it is a great comfort to both the operator and patient. I have a number of patients who come into my office regularly to have their mouths cleansed with this spray—patients suffering from pyorrhea. This is done, not with the hope of curing

the pyorrhea, but with the idea of keeping the teeth as comfortable as possible, before they will eventually have to be lost. I am so very enthusiastic in the value of this outfit that I think every man who does not possess one is denying himself of a comfort and a very efficient apparatus in his office, and I want to thoroughly impress that fact upon you all.

Dr. Belcher's paper was passed.

Dr. Burkhart moved that the Executive Committees of the Seventh and Eighth District Societies request the Sixth District Society to hold the next union meeting on Friday and Saturday of the last week in October, if agreeable to them.

The motion was carried.

Motion was then made and carried to adjourn until the next annual meeting.

AMERICAN DENTAL CLUB OF PARIS.

President—DR. W. S. DAVENPORT.

Abstract Report of Meetings held in 1903 and 1906.

(Continued from page 760.)

(II.)

A PAPER was read by WM. HIRSCHFELD, D.D.S., Paris, as follows:

CORRECTION OF A MISPLACED ANTERIOR TOOTH BY MEANS OF PORCELAIN.

The first attempt in this special line of work was reported by the writer at a meeting of the New York Odontological Society held October 16, 1900.

In this paper I described the case of a young actress whose upper right lateral incisor was so badly turned that the lingual surface constituted the distal one and the labial the mesial surface. As the result, a space existed between the misplaced lateral incisor and the canine. It was then that it occurred to me to fill

up the gap with porcelain. To accomplish this I cut out a sufficient amount of dentin from the labial surface—which as stated above occupied a mesial position—in order to secure a good anchorage for a block of porcelain, which, after having been carefully adapted, gave the appearance of a normally shaped tooth.

It was this result which induced me a short time ago to attempt by similar means the correction of another type of irregularity—namely, the case now to be described.

The patient was a young artist of about twenty-eight years of age. He consulted me in 1900 regarding the neglected state of his teeth.

At that time he casually referred to the malposition of a left lateral incisor,

which marred the appearance of his otherwise sound and regularly placed anterior teeth. At first sight it might have been thought that this tooth did not exist at all. It was situated directly behind the canine and the central incisor—which teeth also slightly overlapped it—and to make this condition of things still worse the tooth was a devitalized one, and therefore much darker than its neighbors.

Since the first visit the patient had come to me at regular intervals to have his teeth examined, and each time urged me to improve the unsightly appearance of the malposed and discolored incisor.

The means which would ordinarily have been employed to remedy the existing conditions would have been either to cut off the crown and substitute it by a pivot tooth of normal appearance, or to try to force the tooth back into its normal position.

My objection to a pivot tooth was that even the most artistic artificial crown could never give the same degree of satisfaction as the natural tooth itself.

Against regulating the tooth there was the strong objection that even had the operation been a successful one, it would have been of but temporary duration, owing to the existence of a marked mandibular protrusion, which prevented the upper teeth from coming in contact with the lower; and consequently the regulated tooth would have fallen back to its original position unless permanently attached to its neighbors. Under these conditions I had recourse to porcelain.

Why not do in this case what I had tried with success several years before? Why not cover the face of the tooth with an inlay which would match in thickness and in color the adjoining teeth? And that which was an objection against regulating was here an important factor in favor of the work, inasmuch as the open-bite malocclusion would insure the permanence of the operation. And last—but not least—the tooth being a devitalized one, a sufficient area of dentin could be painlessly cut away in order to secure a strong anchorage for the porcelain. The only difficulty to overcome was the narrow space between the central

incisor and canine; but as these teeth had fillings on their approximal surfaces, I thought that no special harm could be done by grinding off a trifle of these fillings, in order to secure the necessary space for the future inlay.

All these considerations once explained to the patient, he gladly agreed to have the operation carried out. Separations were first obtained by means of a diamond disk. The next step consisted in grinding off the enamel from the upper surface of the incisor, and in cutting out the interior of the whole crown in order that it should assume internally the form of an oblong box with well-defined parallel walls. A matrix of No. 40 gold foil was swaged in the cavity, invested in asbestos, and the inlay fused therein. It required about six fusions in order to obtain sufficient thickness of the porcelain intended to represent the missing tooth. After having ascertained that the inlay fitted the cavity accurately, its under surface was carefully undercut and cemented to place.

The result was a most satisfactory one to both patient and operator.

In conclusion, I may add that the probabilities at the present time are that the operation will be a lasting one, for the inlay filling the cavity accurately, and not being exposed to any strain, cannot possibly be forced out from the cavity.

Dr. R. ANEMA then read a paper on "The Orthodontia of Today from the Standpoint of the Orthodontist," of which an abstract follows:

THE ORTHODONTIA OF TODAY FROM THE STANDPOINT OF THE ORTHODONTIST.

The writer referred to orthodontia as the science and practice of occlusion. Occlusion from an anatomical standpoint was defined as the contact of the masticating planes of the upper and lower teeth when the jaws are at rest.

Of normal occlusion he said it was the way in which, at a certain epoch in life, the full complement of teeth—or their equivalent—must interdigitate, and that normal occlusion cannot exist in the absence of an overlapping contact of the me-

sio-buccal cusp of the first molar with the two buccal cusps of the lower first molar.

The subject of normal occlusion involves a consideration of the self-retention of the teeth, the overbite, the compensating curve, and the line of occlusion.

In cases of malposition of the teeth, as they present themselves in practice, one finds that the occlusal force is an important factor in its causation. To properly substantiate this opinion, two of the most common causes of malocclusion—namely, dental caries and the extracting forceps—were explained at length. The essayist should not be understood, however, as meaning that occlusion is the only factor in the etiology of dental irregularities.

He then took up the subject of orthodontia proper, and discussed (1) time of treatment; (2) impressions; (3) photographs; (4) appliances.

He gave an *exposé* of the methods as taught at the Angle School of Orthodontia, emphasizing the necessity for early treatment, and calling attention to the critical periods in the evolution of the permanent denture, viz, the eruption and coming into contact of the first molars. He also explained, from a histophysiological point of view, the reasons why real success in orthodontia operations can only be expected in youth and not later on, when the teeth and jaws have become so settled as to render it very difficult to displace them.

Under the discussion of impressions he inferred that plaster impressions were the only reliable ones for orthodontia work, and that the yielding impression materials invited inaccuracy by reason of the outward and inward leaning of the arches, the contour of the crowns, the shape of the canine fossa, and the greatest of all sources of inaccuracy in the use of yielding impression materials—viz, malposition of the teeth itself. Where plaster breaks and afterward the pieces can be put together, other materials yield. With plaster not only is the contour of the crowns correctly reproduced, but also the roots as far as they show through the gums, and even the at-

tachments of the muscles as far as they appear in the bucco-alveolar fold. The extent of root-movement can be ascertained, with a reasonable degree of accuracy, by comparing a plaster cast obtained from a plaster impression before treatment with a cast obtained by the same means after the treatment is completed. In addition, the plaster impression enjoys the distinction of having made possible the demonstration of the superiority of the single-arch appliance over the double-arch appliance.

The essayist then took up the subject of photography in orthodontia. Photographs are a great help in the study of facial lines, and in the broader study of occlusion. They are not only of diagnostic value to the operator, but also have a definite didactic value, inasmuch as photographic reproductions of cases before and after treatment, when exhibited by means of the projecting lantern, give to dental audiences an opportunity "to observe, compare, reflect, and record." Photographs methodically taken were said to constitute a strong commentary on the judgment of the operator, and as in scientific work one is generally compelled to accept the statements of the researcher in the absence of means for verification of his own opinions, we consequently should be glad to avail ourselves of the photograph system as a help in scientific and artistic progress. Large collections of casts taken from plaster impressions, together with photographs of the casts taken before and during the progress of treatment, must necessarily represent a scientific means of avoiding misunderstanding.

In a general way it has been said that appliances, more than recognition of cause and treatment, have taken a very prominent place in the past. It has occurred too often, that without considering the interdigitation of the first molars and canines, extractions were made and appliances inserted. In past years the essayist himself has done likewise. As a rule, every appliance that could possibly re-establish normal occlusion, and did not work too slowly, was considered good. Removable appliances

were said to represent a source of disappointment to both patient and practitioner. The appliance on the principle of the extension bar, published in 1728 by Fauchard, with its up-to-date improvements, should be the best. It furnishes the power for expansion, offers a fixed point from which to rotate, and shifts the mesio-distal relation of the teeth and arches.

Regarding the selection of appliances the author emphasized the advisability of using as simple and as few appliances as possible.

Discussion.

Dr. I. B. DAVENPORT. Dr. Anema modestly approaches his subject as a student of orthodontia, and asks our criticism and advice. His enthusiasm in the work is shown by his having followed in 1904 the course in orthodontia under Dr. Angle, the eminent teacher, and founder of the first school devoted exclusively to the subject of orthodontia.

The doctor has gone to the great trouble of searching through various museums for perfect human dentures, and has delighted us by his fine collection of lantern slides, which will become most important documents to the orthodontist. His paper was read in a most impressive manner, and has no doubt settled many points concerning occlusion in the minds of those who hitherto may have had rather hazy views on the subject.

I am in full sympathy with Dr. Anema's principal thought, viz, that "occlusion" is the basis of orthodontia, but I was disappointed to find that the knowledge of occlusion appears not to have made any advance since the publication of my papers in 1887 and 1892. Dr. Anema having accepted the view that occlusion constitutes a true scientific basis for orthodontia, concludes that it ought to be practiced as a specialty.

One would almost think, to read some of the late writings upon orthodontia, that this branch had the exclusive right to the science of occlusion. But it is taking a very narrow view of occlusion to hold it to be merely the basis of orthodontia, for occlusion—I prefer the term

articulation of the teeth—is the very foundation upon which rest all branches of practical dentistry, as I pointed out years ago. It is as important to the operator, the crown and bridge worker, the dental surgeon in the treatment of fractures of the jaws, the maker of artificial dentures, and even to the pyorrhea specialist, as it is to the orthodontist; and the mechanism and law of articulation of the teeth is now pretty well taught in all good dental schools, and is part of the general knowledge of the dentist.

To Dr. Anema's contention that orthodontia and dentistry proper are essentially different, one being preventive and the other curative, I reply that prevention is the keynote of every department of dentistry today. Every operation and every act is in one sense or another preventive, corrective, and curative. The object of all branches of dentistry ought to be to secure, as nearly as possible, a normally working masticatory apparatus, one capable of performing the highest functions it is intended for, and for which purpose it was evolved—and it is only by correlated efforts that that result can be secured.

As the law of articulation is now a part of the general knowledge of the dentist, he is better able than heretofore to apply its principles to his cases of irregularity of the teeth, and really has much less need of the specialist's aid. And owing to the simplifying of appliances, and the present advantage of being able to buy them in parts and ready-made, we find another reason why the general practitioner may undertake cases of orthodontia with less temerity and with far greater certainty of success.

I am not one who favors exclusive specialties in dentistry, or at least not without a long experience in general practice, and after a good sense of proportions has been established thereby. After forty or fifty years of age, a man may very well become a specialist, but to start as an exclusive specialist in any department of dentistry tends, in my opinion, to make one too narrow; one is apt to see one thing only, and that from the standpoint of his own specialty.

A general practitioner may be a specialist without being an *exclusive* specialist, but personally I prefer not to be considered a specialist at all. I might say I am an operative specialist because I spend several hours a day filling teeth, or that I make a specialty of pyorrhea treatment, because about one-third of my time, for years, has been occupied in the treatment of that disease—or in work which had for its object the prevention of pyorrhea. Again, the regulation of teeth has been a matter of great interest to me, and I have always occupied myself very much with mechanical dentistry, having even been an extractor of teeth, although in the latter case my reform was complete, and occurred years ago; but to my mind, while all one's powers ought to be brought to bear on each special operation, any one operation is a mere detail in the working out of a general plan of treatment, looking always to the highest well-being of the organs of mastication as a whole.

We have all seen irreparable injury done to teeth during the short space of time required to regulate them. If a man's responsibility and interest in the patient be limited to a comparatively short period—say from three months to two years, as is apt to be the case with the specialist—he may not insist upon the necessary cleanliness on the part of the patient, and may overlook or ignore incipient decay; and in the use of appliances may carelessly choose those which favor uncleanness and so endanger the future welfare of the teeth.

There is, however, a very practical reason for the orthodontist as an exclusive specialist—in the demand for him; for some dentists do not care to undertake cases in orthodontia, and others care to do nothing else.

To recapitulate, I may say that as the science of occlusion is now better understood and taught, the regulation of teeth is consequently better understood, and all may practice it better and more easily than heretofore.

The general practitioner who has done regulating all along has greater experience than the young specialist, and his

judgment should be better as to what ought to be and what can be accomplished; he has, moreover, a better appreciation of the relations of the operation in hand to the other branches of his art; but, on the other hand, the broad-minded specialist will become the more skilful in doing the one thing as he grows older in his specialty.

Dr. Anema tells me that at the school of orthodontia with which he was formerly connected, only one appliance is used, and he says, "Having found the best—stick to it." I admit that that "appliance" has a very wide application. I use it in a great number of cases with much satisfaction, but I often use others, in certain cases, with equal satisfaction, and where I am certain, in my hands at least, that the first-mentioned appliance would not accomplish the work as well.

All appliances which are fixed to the teeth, while possessing certain great advantages have also drawbacks, one of them being the danger to the teeth on account of the difficulty of securing perfect cleanliness.

Dr. Anema dates the new period of emancipation from old ideas to the establishment of the special school of orthodontia in 1900. I would not detract in the least from Dr. Anema's appreciation of Dr. Angle's influence in establishing orthodontia upon a scientific basis—the science of occlusion—but I cannot refrain from remarking that the "law of articulation," or "occlusion," if you prefer that term, had been propounded, and its influence upon irregularities of the teeth, its importance as a factor in the retention of the teeth after correction of irregularities, as well as the protest against extraction and other forms of mutilation of the dental arches of man, had all been brought out years before.

Long after the publication of these facts Dr. Angle was still publishing works on orthodontia, illustrated by cases in which extraction of teeth had been practiced in flagrant violation of the laws of articulation.*

* For example see COSMOS, vol. xli, pages 838-840.

That Dr. Angle has since become a leading exponent of the doctrine of occlusion is altogether to his credit, and he is thereby rendering a great service to orthodontia. I cannot too earnestly recommend you to read his recent paper, read before the Institute of Stomatology of New York.

Now let us go back and define our position a little better. Normal occlusion is justly the principal and fundamental thought of Dr. Anema's paper, yet I fail to see that he has given any comprehensive definition of occlusion, although he has mentioned some of its characteristics.

In all my own studies of the arrangement of the teeth, I have used the old term articulation, which I prefer to the new term occlusion, the one most employed at the present time, as it appears to me that occlusion, which signifies to close, ought to be applied to the striking ends of the teeth—where they shut together; in other words, the masticating surfaces, and possibly, also, the points of approximal contact.

The old term—articulation—is perhaps bad, but by long usage has been made to include not only all that is implied by occlusion, but also, properly speaking, includes the relations of the teeth in their sockets—the dento-maxillary articulation—and even the temporo-maxillary articulation through its influence upon the general articulation of the teeth in relation to the masticatory surfaces, masticatory curves, and masticatory movements.

I therefore prefer the broader term, which includes *all* the factors bearing upon the relation of the teeth to each other, during all their movements. Occlusion seems to me only *almost* the basis of orthodontia.

But it matters not what term is used, if, in considering irregularities, the following basal fact is kept constantly in view, viz, that a correct arrangement of the masticating organs of man is one in which all the forces, regularly acting, of every kind and from every direction, are so perfectly balanced that a relatively permanent position is secured, while at

the same time the highest functional capacity is developed.

I use the term "relatively permanent position" with due thought and intention, for growth in youth and especially wear by age—as examples—necessitate certain readjustments of this complicated machine, which is so perfect that all the changes between youth and age have been brought about without the slightest derangement at any time.

To show you that my definition of normal articulation or normal occlusion is not new, I will quote from my paper read at Heidelberg, August 1891, and published in the *International Dental Journal* for January 1892, page 3:

"In other words, a perfect articulation is the harmonious adjustment to each other of two most beautifully complicated, uneven, triturating surfaces, in such a way as to permit all the movements of mastication, each prominence or depression having special reference to the normal movements of mastication, and to change their form or direction would be to render such movements impossible.

"When thus perfectly arranged the masticating surfaces slide upon and into each other, constituting a self-sharpening machine, made up of a complicated system of inclines, so balanced and bound together as to be practically permanent."

Also on page 7 of the same paper: "I have previously shown that the normally arranged human teeth touch all around in both arches.

"In order to be well articulated the teeth must be regularly placed and correctly inclined.

"The most common irregularity of the teeth is the irregularity of the position of the masticating surfaces, and yet but little attention is given this matter in works upon irregularities, the attention being mostly confined to the deviations of the external curves or alignment of the teeth; yet if the former were attended to, the latter would necessarily be corrected, and more permanently so than is usually the case.

"When teeth are regular and well artic-

ulated, they remain so because the forces and resistances are evenly balanced.

"On the other hand, as the articulation is made up of a series of perfectly balanced inclines, it follows that when anything removes one surface, whether an extraction, decay, operation, or badly-constructed regulating or other apparatus, undue force falls upon other inclines, with the certain result of changing the position of the tooth or teeth.

"I have hardly ever found what I could call a good articulation a few years after teeth had been extracted, and the same is true when the teeth had been cut away between, or when the cusps had been carelessly removed while finishing fillings in the grinding surfaces.

"Such teeth antagonize but do not articulate, and cusps strike cusps point to point, instead of passing between each other like cogs; and the motions of mastication are interfered with, especially the rotary, which is the essentially grinding motion, and hence the rapid wear of the limited number of antagonizing points goes on, as already spoken of.

"Largely on account of bad articulation irregular teeth tend to become more irregular. Growth may improve some cases, but so far as a bad articulation goes it is always unfavorable to regularity of the teeth.

"Much harm is done by the use of regulating appliances which change the articulation without improving it, and it is almost a universal fact that unless an improvement can be made in an articulation there will be no permanent improvement of the irregularity.

"Finally, the articulation is the only permanent retainer to be depended upon.

"The teeth will move till they find the best contact that circumstances can offer, and that movement often never ceases, because the forces never find equilibrium.

"Before disturbing the articulation of a fixed irregularity, it is best to consider whether such disturbance can be overcome, and the articulation again made as good; if not, the chances are that the result will be worse than the original condition, and for the ultimate result we must wait, not only 'till the teeth become

firm,' as we say, but until they cease to move."

With this broad view of the basis upon which the dental arches are built well in mind—call it the law of articulation or the science of occlusion—we may make the application to irregular teeth for the purposes of diagnosis and prognosis, while it is also a guide to treatment and the basis of retention.

I wish to call attention to a danger of exaggerating the importance of any one factor of articulation as a retaining force. As I have insisted all along, it is the total result of all the acting forces that determines the equilibrium or rest at the point of greatest efficiency.

The binding articulation, the interdigitation of cusps, while a most important factor, may be of insufficient avail against a condition in which the axes of the teeth are out of relation, owing to their being too greatly inclined in their sockets.

This is the case, as occasionally seen, when a perfectly regular set of teeth, with occlusal surfaces in perfect relation, move out of line, the teeth separating or projecting—in short, becoming irregular. Real occlusion has failed because other factors have acted more strongly than the retaining influences. This might be due to a too great leaning forward of all the teeth—producing, consequently, arches which fall out instead of coming together—or to an impacted third molar, or even to pyorrhea, by weakening certain attachments of certain teeth.

Another point to remember is that while the normal arch is auto-retaining and permanent, and that in a general way irregular teeth rather tend to become more irregular, we often find cases of irregularities in which a position of rest—or equilibrium without efficiency—has been reached, and it may be a serious question to decide whether treatment will secure an improvement which will be permanent.

It is judgment based on a broad view of the laws of articulation which will decide the point. In our present state of knowledge not every case of irregularity can be perfectly and permanently corrected.

In reference to the compensating curve of the arch, Dr. Anema quotes Dr. Bonwill as saying in effect: "The overbite of the upper incisors should be equal to the depth of the curve." While that may be true in some cases, it is an error to consider the overbite directly or necessarily related to the curve, as I have long ago pointed out. (See American Dental Club of Paris Report, October 23, 1897, page 6*), in which I wrote as follows:

"Dr. Bonwill says in reference to this: 'Always bear in mind that the curvature upward at the ramus of the upper set is always in proportion to the overbite. For an upper set alone, you can tell how much the upper incisors should overbite by looking at the curvature of the lower molar teeth remaining. If an eighth of an inch out of line, the overbite should be fully so.'"

To this I replied as follows: "The fact is, that the curve of the arch is in relation to the articular eminence in a normal case; it is to compensate for the otherwise wide separation of the back teeth that would occur when the jaw is moved forward. It preserves the parallelism of the masticating surfaces of the two arches, and thus furnishes continuous articulation, and this even after the teeth are worn flat and the overbite has disappeared.

"Without the curve the teeth would always be separated at the back when the jaw was moved forward. *In a normal arch it is the cusps which are in relation with the overbite*, as I have often insisted.

"This relation of cusps to overbite, joined with the correct relation between the curve and the articular eminence, gives us the continuous slide up and down the inclines of the articular surfaces of the teeth from one plane to another on the side in use.

"This skull proves to you that the overbite is not essentially in relation with the curve, for the overbite has disappeared by wear, but the curve remains, as you see.

"On the other hand, it proves what I stated in 1887, that when the cusps wear

off, the overbite wears off, and you have the edge-to-edge biting in so-called double teeth all round."

In one paper, while protesting against extraction as a supposed means of improving those horrible cases of over-projecting upper front teeth with deep bite, I said that I would thank the man who would show me how to treat them. I now do thank the man or men who showed me the use of the intermaxillary elastics, which when employed in the new light of the law of articulation give such excellent results.

As a last word to all would-be orthodontists: Be an orthodontist if you will, but be a dentist first and always—be broad and avoid hobbies.

Dr. CHOQUET. I have studied the general ideas on orthodontia as presented by the essayist in his paper, and ask your permission to submit to you a few observations connected with this work, for, although I agree with its general outlines, there are nevertheless certain points on which I am quite opposed to the author's views. Although I am not an orthodontist in the special sense of the term, yet I have studied the question from both anatomical and physiological points of view. In my first essay on the subject I contested the theory, or rather the opinion, expressed by Tomes, the author of the book from which almost all of us have studied dental anatomy. According to that author, the relation between teeth, in a state of occlusion of the jaws, is effected in the following manner: "All the teeth in man rise to the same level, without any discontinuity between them," etc.

I consider that definition as entirely erroneous, and capable of bringing confusion and false ideas into the minds of students, and in my classes at the École Dentaire I invariably, by means of models, demonstrate to my students the fallacy of that contention. For if this definition were true, the result would be, if we laid a maxilla with full dentition on a flat surface—on a table for instance—that all the teeth, or rather all the free edges and all the cusps of each of these teeth, would come into intimate contact—into perfect contact with the flat sur-

* A paper never yet offered for publication
—I. B. D.

face. The occlusal relations between the jaws would not then form a curve, or a more or less sinuous line, but on the contrary a straight line, which I have called the ideal straight line of Tomes. I have called it ideal because it appears only to exist in Tomes' mind. As a proof of what I say I may state that among the 20,000 skulls in the Museum of Natural History, which I have examined and studied for the past eight years or more, I have only twice met with such a disposition in the occlusal relations of the teeth. The percentage is therefore so small that we can, and must, consider Tomes' definition as absolutely erroneous.

But that which is abnormal in the adult, whose dentition is exclusively composed of permanent organs, becomes normal in the child, with its temporary denture. If you examine any number of children's skulls with deciduous teeth that are not movable in consequence of a commencement of resorption of the roots, you will see that only in such cases do the teeth "rise to the same level," and the cusps or free edges of each organ come evenly into contact with a flat surface.

You will see, moreover, that this occlusal line, according to whether it be sinuous or, on the contrary, straight or approaching the straight line, implies, as was first pointed out by me, certain marked and typical modifications in the temporo-maxillary articulation. But first of all let us examine the conditions observed when the two jaws of an adult are in occlusion. If we examine the profile of a skull, we note that the line of occlusion is more or less curved, more or less sinuous, assuming perhaps the shape of the letter S, and that the culminating point of that sinuosity corresponds, ninety-nine times out of a hundred, to the prominence caused by the upper first molar, which must of course cause certain changes in the temporo-maxillary articulation. These changes may be outlined in the following fashion: With a straight line of occlusion, or one approaching a straight line, the glenoid cavity will be large and badly defined, the condyle coming in contact with it

only on its superior surface. With a more or less sinuous line of occlusion, the glenoid cavity is narrow, angular, with very clear and well-defined edges, and fits the condyle very closely, quite contrary to what occurs in the former case.

If we examine a mandible from above, it presents a horseshoe shape. We will find that the anatomic characteristics of the condyles—to my mind the basis of orthodontia—may vary in each case. Sometimes they will be parallel on a straight line, and their transverse axes will meet. Again, on the contrary, they will be disposed more or less obliquely in relation to one another. Each of these arrangements should be interpreted in a different way, for they necessarily imply certain typical conditions at the temporo-maxillary articulation, and consequently certain variations in the movements of mastication.

To thoroughly understand what we mean, let us trace on a photograph of a mandible, seen from above, a straight line uniting the outer extremities of the condyles, without taking into consideration their greatest axes. Now let us divide each condyle into two equal parts by another straight line. In a number of cases we shall find that this second line will not run into the former, but on the contrary will form with it an angle more or less accentuated. If the second lines dividing the right and left condyles into equal parts be prolonged, the two lines will meet at a given point, which will almost always correspond to the center of the foramen magnum.

What practical conclusions can we draw from a study of the greater or less obliquity of the condyles? First, that in those cases in which the axes of the condyles run into one another, the lateral movements of the mandible will prevail; whereas, on the contrary, the greater the angle formed by the axes of the condyles the less marked will be the lateral movements. In the latter case, the movements of mastication will be more particularly of the up-and-down hinge type; whereas in the former, the masseters and temporals will exercise their normal function, and the internal and external pterygoids

will work simultaneously and cause the mandible to move laterally.

We may compare man's temporo-maxillary articulation, when the axes of the condyles meet, to that of a ruminating animal; and when they do not meet, to that of a true carnivorous animal. It is easy to understand how each of these conditions will result in certain dental anatomical changes in old people, and in those who partake of more or less rudimentary food. In the first case the abrasion of the teeth will be of the nature of a flat surface affecting the entire surface of the crown, but retaining the primitive occlusal line, whereas in the second case the abrasion will cause the teeth to become bevel-edged, those in the maxilla will lose the mesio- and disto-buccal cusps, and in the mandible the mesio- and disto-palatal cusps will be the abraded ones. It is true that the teeth will continue to fit one into the other, but no longer as they originally did, and there again we shall meet the primitive line of occlusion.

The points to which I have called your attention are important, as much from the point of view of corrections as from that of the construction of prosthetic appliances. I have stated elsewhere—and I shall repeat it this evening, for my opinion has not changed on this point—that in the construction of artificial dentures we should consider as a principal factor the relations of the condyle to the glenoid cavity, and not merely the action of the muscles of mastication.

In conclusion, there is another point to which I desire to call your attention, and for which I claim priority. It is that of the relation of the axes of the teeth when the jaws are in occlusion. I presented in 1903, to the Odontological Society of Paris, a report in which I described four ways in which these relations may be present in the mouth.

Later I was surprised to find in the DENTAL COSMOS, 1905—vol. xlvii, page 552—a communication by Dr. Grevers

of Amsterdam, presented at the Fourth International Dental Congress, in which he refers to the relative direction of the axes of the teeth as "enarmosis," "epharmosis," "prosarmosis," "versio," etc.

Dr. ANEMA (closing the discussion). I regret that the hour is so advanced that I cannot reply in full to the many interesting—but at the same time debatable—points which were brought forward in the discussion.

In my opinion, occlusion is a very effective term, notwithstanding that Dr. Davenport seems to favor articulation. I do not agree with him in the statement that the term articulation may be correctly used instead of occlusion. I think it about time that we should drop erroneous and misleading interpretations. Articulation has been misused so much in the past, that we should endeavor to remedy the mistake at once by using it only to designate the temporo-maxillary mechanism. This opinion is in accordance with the general anatomical meaning of the term: "Joint or articulation in the animal body is a more or less movable joint of two bones, which touch each other at slippery surfaces. These joint surfaces are provided with a cartilaginous cover and are held together by means of muscles, ligaments, fossæ, and surrounding membranes."

The point I wish to emphasize is the cartilaginous cover. This must be present in every joint or articulation. It is not present in occlusion, i.e. we do not find it on the occluding surfaces of the teeth. Regarding the physiological or functional difference between "articulation" and "occlusion," I will say that the former allows for movement to adjoining parts; whereas occlusion implies rather trituration, a function altogether different from the one inferred by articulation.

Articulation and to articulate, should therefore be substituted by *occlusion* and *to occlude*, which words have already been adopted by some orthodontia specialists.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, and Mexico. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, SEPTEMBER 1907.

EDITORIAL DEPARTMENT.

IT HATH "A VERY ANCIENT AND A FISHLIKE SMELL."

THE principal daily paper of Minneapolis announced the opening of the recent meeting of the National Dental Association in that city under the title—printed in large bold-face type—"Tooth-Pullers Open Convention"; and one of our contributors has sent us a clipping from a Utah daily paper in which his forceful though courteous protest against the rather common tendency of the average newspaper scribe to apply designations of this character to professional gatherings of dental practitioners is treated with characteristic sarcasm, not to say contempt.

It is no uncommon thing for certain members of the daily press to indulge in that type^d of vulgarity—for vulgarity it is, without qualification—which is an index of the general tone of the paper that does it. There are newspapers *and* newspapers—those that are "yellow" and those that are not; those that believe that there are enough clean-minded people in the world to guarantee success to the enterprise of publishing a paper that a man of

decent instincts would feel safe in putting into the hands of his family, and there is the other kind that goes through society with a muck-rake, and under the guise of "news" obtrudes upon the public its loathsome accumulations, which if printed and sold in book form would be excluded from the mails as obscene literature.

A decent paper is above the form of vulgarity which refers to dentists as "tooth-pullers," "tooth-tuggers," "jaw carpenters," and similar strained attempts at humor; and moreover, a decent daily paper that has accidentally or ignorantly been guilty of such an infraction of ordinary good taste will correct the error when its attention is courteously directed to it. This we know to be the fact, for it has been done in Boston, in Buffalo, in Philadelphia, in New York, and elsewhere; so that it is now a rare thing for a paper in any of the places above mentioned to treat the deliberative bodies of dental specialists other than with the courtesy to which any serious and earnest convention of workers in all departments of human activity is properly entitled.

It not infrequently happens that members of the dental profession who have justly resented the type of newspaper treatment here under consideration have been inclined to feel that dentistry itself was in some degree responsible for this attitude of a minority of the public press—that in a measure it reflected the average of public opinion as to dental professional standards, especially because it rarely happens that medical or surgical conventions are treated to analogous designations, such as "pill-mixers," "bone-sawyers," "boil-slitters," and the like, as in decades gone by. We are inclined to view this tendency upon the part of some of the daily press to treat dental matters with frivolity as, in the first place, a relic of antiquity; and in the second place, as a type of vulgarity that only originates with and caters to individuals of the yellow-journalism order of intelligence. Viewed as a relic of antiquity, the tendency to regard toothache and tooth-extraction as a practical joke upon the unfortunate sufferer is as old as the earliest dental records, for during the past three centuries it has afforded humorists, both literary and pictorial, a perennial source of inspiration. Indeed, a whole volume of so-called jokes of the dental genus has been gathered together and published, but we have not as yet seen it listed among the ten best-selling books of any year. And other volumes filled with the same sort of twad-

dle might be published if anyone desired to waste the time, money, and energy in doing so—and even then the half would not have been told. A small picture gallery could be filled with the production of artists, and those who think they are artists, that have tortured the tooth-pulling and the toothache *motif* into all manner of caricatures.

But this is unqualifiedly an age of progress. Do we not have indisputable evidence of that fact all about us? Does not the daily newspaper itself stand as an eloquent example thereof?—for it is no longer printed from movable types on a hand press, but issues from one of those wonderful pieces of mechanism which seems to lack nothing of perfection save a living soul. But, notwithstanding all this progress there are still some minds, linked with the barbaric past, that will relish what is called a dental joke just as Martial did, and perhaps Homer as well. One rarely finds a newspaper of the urban type with temerity enough to wring the humorous changes on the mother-in-law theme, or that of its contemporary the pater-familias in the agonies of putting up the kitchen stove-pipe;—these have had their day, served their purpose, and gone out of use. The dental joke dies hard, but it is so far moribund at present that it has become an offense, and the newspaper that continues to use it stamps itself as intellectually senile and guilty of a vulgarism that is as unsavory as it is discourteous.

THE PASSING OF PROFESSOR MILLER.

WE have elsewhere in this issue attempted to give a general sketch of the career of Professor Miller in which will be found a record of the main events of his life and professional work. That he possessed many of those characteristics that mark the man of genius we think is generally conceded. The rarity of such men is sufficient reason why the termination of their earthly activities should receive more than passing consideration. Miller was a phenomenon in dentistry. He came into its professional life at a period when it was beginning to emerge from a condition of pure empiricism into a dawning rationalism in its attitude of thought. Inspired by the practical study of Koch's

epoch-making researches and improved methods of laboratory technique in bacterial investigation, Miller quickly saw the great promise of usefulness to dentistry that would result from the application of these same methods to the study of dental pathology. The result was his series of papers upon dental caries beginning about 1882 in *Klebs' Archives* and thereafter continued in the *Independent Practitioner*. Miller had at that time been but three years in dental practice, but this work made him famous—a fame which increased in brilliancy down to the last. So versatile and so conclusive has been his thought that in nearly all departments of dental investigation he came to be regarded as the final authority—a position which he maintained so easily and with such simple-hearted self-forgetfulness that the dental world has grown into the habit of mind of accepting his dictum on scientific matters without question. It is because of this habit of mind that the loss of this great personality will create a void in the profession of dentistry that will be increasingly felt.

The scientific idea in relation to any department of life makes but slow progress against the opposing tide of empiricism with which it must necessarily contend; the so-called "practical" man who knows "how" is generally in higher popular favor than the scientific or rational man, who must also know "why." Miller demonstrated by his life-work the essentially practical character and usefulness of scientific work. He gave a dignity and meaning to scientific research in dentistry, so that the empirical worker could understand it and utilize its results. In this way he profoundly influenced the various dental operative procedures for their betterment, particularly the technique of all operations involving the factor of vitality. He so stimulated an appreciation of scientific methods that a general desire for the furtherance of research in dentistry is now expressed at nearly all dental meetings, and the idea that we must know the reason why in order that we may best know how is the general attitude of mind in the dental profession today. For this advance, above all else, dentistry is indebted to the work and efforts of Professor Miller. For this he will continue to be honored by generations of dentists yet to come, and to them as to us he will always be the inspired genius and the benefactor of his calling. To his profession his untimely death is an irreparable loss. Others will carry

on its work in other ways, but the place of Miller will not be filled. Our sympathies go out not only to his bereaved family and kindred, but in a special way to the University of Michigan, its administrative officers, faculty, and students, for the great loss which they have sustained.

A CORRECTION.

IN the article by Dr. C. S. Van Horn, entitled "A Rambling Discourse on Inlays," printed at page 827 of our August issue, "No. 23 gage," on page 832, first column, seventh line from top, should read No. 28 gage.
—Ep.

REVIEW OF CURRENT DENTAL LITERATURE.

Conducted by JULIO ENDELMAN, D.D.S.

[*l'Odontologie*, Paris, May 30, 1907.]

PSEUDO-ODONTALGIA OF GRIPPAL ORIGIN. BY PROF. MAURICE ROY, ÉCOLE DENTAIRE, PARIS, FRANCE.

About two years ago the author reported, at a meeting of the Société d'Odontologie, a peculiar form of pseudo-odontalgia of grippal origin which he had observed in the course of several epidemics of the grippe. A recent epidemic has made it possible for the author to observe a large number of new cases and to more precisely study the minute manifestation of the form of dental disorder under consideration.

The disturbance manifests itself in the form of neuralgia very definitely localized in certain teeth of the maxilla, and caused, doubtless, by the involvement of the maxillary sinus. The teeth which are the seat of the severe pain show no plausible external or internal evidences of disease in either pulp or pericementum, and in addition it is certainly most interesting to record the fact that in all the patients suffering from this form of pseudo-odontalgia examined by Dr. Roy, every tooth seemed absolutely sound.

At first the essayist seemed inclined to

consider the neuralgic disorder occurring in the course of an attack of the grippe as a coincident phenomenon, rather than as one brought about directly by the systemic disorder; since then, however, owing to the relatively large number of such cases that have come under his observation, he has been led to adopt the latter view, namely, that a form of pseudo-odontalgia of grippal origin is a definite pathologic entity, and that it develops almost exclusively in people having perfectly healthy teeth. In nearly all the cases examined the neuralgia occurred at the final period of the grippal attack, and in only a very few instances after the grippe seemed to have entirely disappeared. It was observed as frequently in children as in adults.

The pain is at first generalized over the entire head, but gradually becomes localized in one or several upper teeth, more frequently in the second molar. Occasionally, however, it also involves the bicuspsids. The pain continues, and becomes so severe that not infrequently patients are led to believe that an abscess is forming. In all the cases examined, although the teeth, as above stated,

and the mucous membranes appeared to be healthy, upon percussion the patient experienced pain in one or more teeth, often in the last two molars, but invariably in the second molar. A very characteristic symptom of grippal pseudo-odontalgia is the production of excruciating pain when, by means of the fingers, pressure is exercised—from the inside of the mouth—on the malar region. The external alveolar plate is also slightly sensitive to finger pressure.

In all the cases observed, the disturbance was unilateral, and was promptly relieved by the administration four times daily of a capsule containing antipyrin gr. vii, quinin hydrobromid gr. iij, and sodium bicarbonate gr. iij. As soon as the pain begins to lessen, the dose should be progressively decreased by one capsule every day, although the administration should not be stopped too suddenly.

[*La Odontología*, Madrid, June 1907.]

A PARTIAL DENTURE LODGED IN THE ESOPHAGUS. BY DR. ERNESTO BOTELLA.

The presence of a foreign body in the esophagus is invariably a serious mishap, the severity of the accident being in proportion to the form and size of the object ingested, and in the event of this being relatively large and angular, may endanger the patient's life. In children this type of accident is, as a rule, due to the swallowing of coins, glass beads, and fruit kernels; in adults it is more frequently the result of the swallowing of fragments of bone concealed in the food bolus, and of artificial dentures which have dropped into the throat during sleep.

The presence of a round and smooth object in the esophagus is, however, a mishap that may be remedied in a relatively easy manner, either by removing the object by the mouth, or, if such a procedure be impracticable, by forcing it into the stomach. Spiculae of bone and artificial dentures, on the other hand, are likely to remain embedded in the walls of the esophagus, and eventually give rise to esophagitis and peri-esophagitis, which in addition to rendering deglutition totally impossible, may be *per se* the cause of a fatal termination.

The history of the case treated by Dr. Botella was as follows: Mrs. A. V., aged forty years, a native of Valencia, swallowed

while asleep a partial plate supporting two upper incisors. She awakened in an asphyxiating condition, which gradually passed off, and shortly afterward she was able to swallow liquid and solid substances, which made her believe that the denture had descended into the stomach. However, on the third day after the accident she experienced uneasiness to a degree which rendered all attempts at swallowing decidedly impossible. As several attempts by physicians to remove the denture or to force it into the stomach utterly failed, the patient then sought the services of the author. At that time deglutition was difficult and painful, even that of liquids, and the only nourishment of which she was able to partake was a few tablespoonfuls of milk *per diem*. In the neck no swelling was noticeable. An esophagoscopic examination—in Röse's position and under cocain anesthesia—located the denture at a point twenty-four centimeters from the alveolar arch. After a number of futile attempts at extraction, esophagotomy under chloroform anesthesia was decided upon, and a short time afterward successfully performed. Owing to the inflamed condition of the esophageal tissues, the wound did not heal by first intention. The patient completely recovered, however, in a comparatively short time.

[*Quarterly Circular* (Ash), London, March 1907.]

ON THE HYPERESTHESIA OF THE BUCAL MUCOUS MEMBRANE. BY PROF. DR. H. BÖNNECKEN, PRAGUE, HUNGARY.

By the name hyperesthesia of the buccal mucous membrane, the author (*Oesterreichische-Ungarische Vierteljahrsschrift für Zahnheilkunde*) designates that condition of disease in which the epithelial lining of the buccal cavity reacts to every external irritant with abnormally severe sensitivity, and in the absence of anatomical alterations. It is rarely observed, and then only in patients of a general nervous disposition, and may be characterized as a neurosis of the mucous membrane. The author considers it as a disease *sui generis*, and not as a premonitory symptom of a severe disturbance.

The chief symptom is a sensitiveness which increases by the use of external irritants to severe painfulness of the entire buccal mucous membrane. Every kind of

cold, hot, or spiced food, every sharp alcoholic drink, and every cigar causes the patient pain in the mouth. The painful sensation spreads over part or all of the buccal mucous membrane. The latter membrane, gum tissue, and gum edges are the most sensitive points; while the dorsum and base of the tongue and palatal vault are the less sensitive ones. Under a mild, non-irritant diet the reactions are slight, being limited to a feeling of dryness or slight burning in the mucous membrane. Following an error in diet, however, the sensitiveness may become so severe as to cause great suffering, and for fear of pain during eating, the patient fails to sufficiently nourish himself. The presence of any source of irritation in the teeth, such as sharp edges, salivary calculi, badly constructed gold crowns, or any other form of prosthetic appliance, intensifies the degree of severity of the disturbance. Vulcanite dentures produce a sensation of warmth or burning on the palatal vault, and occasionally they cause, as they do at times even under normal conditions, a chronic catarrhal state of the palatal mucous membrane, and for this reason cannot be worn by patients affected with the disease under consideration.

After thorough removal of salivary deposits and polishing of the surfaces of the teeth, the patient is made comfortable for a time, and this treatment in conjunction with a non-irritating diet may relieve him entirely until some dietetic error, or a new tartar formation, or some other irritant proceeding from the teeth, causes a recurrence of the malady.

The etiology of the disease is not quite clear, although it is known that tobacco-smoking is a strong predisposing factor. In the cases of hyperesthesia of the buccal mucous membrane observed by Professor Bönnecken, the patients were all smokers, and they themselves attributed the beginning of the disease to the excessive use of tobacco. As abstinence from smoking does not cause the entire disappearance of the trouble, the author believes that there must be some additional etiologic factors. He has observed the disease only in patients between fifty and sixty years of age, but it doubtless may develop at other periods of life, and in women also. In addition, it is this investigator's opinion that many cases reported as glosso-

dynia are in reality some form of hyperesthesia of the oral mucous membrane. The characteristic feature of the disease is a lack of resisting power of the epithelium, and consequently a marked tendency to inflammatory disturbances.

The prognosis of the disease is, as a rule, not very favorable, for it may persist for many years, causing those affected by it much discomfort and suffering. All cauterizing agents, such as silver nitrate or chromic acid; every form of surgical intervention; the application of tincture of iodine, and the use of alcoholic mouth-washes, should be avoided. The teeth should be kept in an absolutely clean condition, and free from calcareous deposits. The use of tobacco and spirits should be entirely discarded, and the diet should be non-irritating and mild. Spirituous mouth-washes, even when strongly diluted, intensify the disturbance.

The sole medicinal combination which proved serviceable was one composed of borax, gr. xlv, honey of rose 3v, painted over the painful areas. Borax in three per cent. solution may be used as a mouth-wash in addition to the foregoing.

A further aim of the treatment should be to give mental quietude to the patient—for some are in constant fear of carcinoma, and are thus robbed of every enjoyment. The patient should be made to realize that he is not affected with a serious disease. It is, of course, self-evident that constitutional treatment of any existing neurasthenic trouble, by means of cold water, massage, or electricity, is indicated.

As an appendix to his article Dr. Bönnecken describes three cases of oral hyperesthesia in male patients aged fifty-six, fifty-two, and seventy-five respectively.

[*Lancet*, London, July 6, 1907.]

BLACKENING OF THE TONGUE CAUSED
BY HYDROGEN DIOXID. BY DR. BIZARD,
PARIS, FRANCE.

At a meeting of the Paris Society of Medicine held on June 8th, M. Bizard read a paper on blackening of the tongue. The remarkable condition, to which Walerand has given the name of *langue noire pileuse* (hairy black tongue), seemed to be produced by very different causes, about most of which there was little definite knowledge. Many of the cases

proceeded simply from foreign substances accidentally coloring the extremities of hypertrophied papillæ. Of this kind was the instance observed by Chatin, in which there was a decided black tint of the dorsal aspect of the tongue in several syphilitic patients who were taking mercury and making use of a gargle containing diluted hydrogen dioxid. In the course of a week M. Bizard saw blackening of the tongue in two syphilitic patients under his care who were treated with injections of gray oil and mouth-washes of a solution of hydrogen dioxid. It might have been supposed that the hydrogen dioxid on coming in contact with the saliva of the mercurialized patients gave rise to a reaction which produced a brown coloration of the extremities of the lingual papillæ, but the fact was that hydrogen dioxid might by itself cause blackening of the tongue. In a man habitually enjoying good health, not syphilitic, and free from constitutional defects, but a smoker and the subject of hypertrophy of the lingual papillæ, the daily use of a gargle of hydrogen dioxid in half a tumbler of warm water produced in eight days a very pronounced blackening of the dorsal aspect of the tongue. This disappeared in a few days when the hydrogen dioxid was stopped, and the surface of the tongue soon afterward desquamated in large flakes.

[*Items of Interest*, New York, August 1907.]

A CASE OF DOUBLE RESECTION OF THE MANDIBLE. By W. O. TALBOT, BILOXI, Miss.

In order to show that the operation of double resection of a portion of the mandible for the correction of facial deformity through excessive lower prognathism may be productive of unlooked-for complications without bringing about the anticipated change in facial expression, the author reports the case of a male patient, age thirty-eight, who presented himself to a surgeon in New Orleans, asking to have a portion of his mandible removed on each side, in order to reduce the prominence of the chin. It was an extreme case, as the mental prominence was most disfiguring. The surgeon advised against the operation, but the patient insisted, saying that he was determined to have the operation performed. Other surgeons were called in in consultation, and the operation finally determined upon. The resection was made on each side, mesial

and distal to the first molars, which teeth, with their contiguous bone, were removed. The operation severed the nerve and the principal blood supply of the anterior section of the jaw. The bones were drawn together and held by wires passed through the bone-ends. No splint was used in this case. Necrosis followed the operation, and it was some time before the patient recovered. The mental prominence was corrected and finally there was some union of bone, but it is questionable if the patient was greatly improved in appearance, as there was a disfigurement on each side and the symphysis dropped down. The patient is now able to masticate a little.

The surgeons recognized their error in operating so far back on the body of the mandible, and now say that they consider the region of the first bicuspid as the proper field for operation in such cases.

[*Revue générale de l'Art Dentaire*, Paris, April 1907.]

FACIAL NEURALGIA CAUSED BY IRRITATION OF THE PULP THROUGH MECHANICAL ABRASION. By G. GUÉRARD, PROFESSOR AT THE ÉCOLE ODONTOTECNIQUE, PARIS, FRANCE.

The author describes the case of a patient who consulted him regarding a severe neuralgia from which he had been suffering for a month previously, and which, reaching the paroxysmal stage during the night, prevented him from sleeping during the best part of it. His physicians having tried several medicinal treatments, without inducing thereby any perceptible improvement, advised him to undergo a careful and thorough examination of his teeth. Notwithstanding his advanced age—the patient being seventy-two years old—he had practically all his teeth solidly implanted in their respective alveoli. Apart from abrasion in the upper and lower right incisors, canines and bicuspid, caused by the stem of a pipe, the teeth appeared sound. None of the abraded teeth attracted the patient's attention, as the pain radiated from below the lower central incisors, and occasionally from the region of the upper molars.

It is well known that, abrasion being a slow process, the pulp throughout the period of tooth-wasting produces secondary dentin. At the time of examination of the teeth of the painful areas, it was found that the pulp of the lower lateral incisor responded most

painfully to the thermal test, showing that it was the seat of inflammatory phenomena. The tooth was drilled into, an arsenic dressing applied, and on the next day the pulp was extirpated. From the moment the pulp became devitalized all pain disappeared. The root-canals have since been permanently filled, and the neuralgia has not recurred. It is probable that in the case of the lateral incisor the abrasion developed so rapidly as to prevent the pulp from throwing out the amount of secondary dentin that would have protected it from external irritation.

[*Revue générale de l'Art Dentaire*, Paris, March 1907.]

ON THE TREATMENT OF FISTULÆ OF DENTAL ORIGIN BY MEANS OF INJECTIONS OF TINCTURE OF IODIN.
By DR. G. DRUO.

The writer reports favorably on the treatment of chronic alveolar abscess with fistula by means of injections of tincture of iodine through the root-canal of the affected tooth. In order to prevent—as much as is possible—the caustic action of the iodine on the soft tissues around the fistula, Dr. Druo recommends the application on the orifice of the fistula of a wad of cotton previously immersed in a saturated solution of sodium hyposulfite. By this means the iodine, which is forced through the fistula, when coming into contact with the hyposulfite solution combines with the element sodium to form sodium iodide—a soluble and colorless salt.

[*Revista Odontologica Paulista*, São Paulo, Brazil, June 1907.]

ERYTHROPHLEIN CHLORID AND ITS USES IN DENTISTRY. By DR. AUGUSTO SOUZA.

Erythrophlein is the alkaloid obtained from the *Erythrophloeum guineense*, and was first isolated by Galois and Hardy. The physiological action of the plant was studied in 1880 by Germain and Bochefontaine. Its chief properties are that it is a heart stimulant and diuretic, although in both instances it behaves rather inconsistently, for, as was shown by Dujardin-Beaumetz, the tincture of erythrophlein, administered in doses of forty drops, gave but slightly positive results in cases of mitral insufficiency. Dalma and Audy (see DENTAL COSMOS, February 1905, page 283) have availed themselves of the additional properties of erythrophlein—an-

esthetic and caustic—for the purpose of obtunding sensitive dentin, with very successful results. Cases of dentinal hypersensitivity of the acutest type were relieved by Audy with minute applications of the alkaloid in eugenol, his observations showing that it possesses, apart from the properties above alluded to, an inhibitory action upon the carious process. The solution employed by Audy was a fifty per cent. solution in eugenol, which, after being introduced in the cavity on a small pellet of cotton and sealed with a temporary gutta-percha filling, was allowed to remain undisturbed for from twenty-four to forty-eight hours. Dr. Souza recommends a solution of equal concentration, although in cases where the layer of dentin covering the pulp is comparatively thin he prefers a weaker solution. He has been able, after two applications at intervals of one or two days, not only to excavate the dentin, but to extirpate the pulp painlessly. Its application seldom causes more than a transient uncomfortable sensation.

[*La Estomatologia*, Bilbao, November 1906.]
EPITHELIOMA OF THE LIP CURED BY THE ROENTGEN RAYS. By DR. B. NAVARRO CANOVAS.

Dr. Navarro Canovas reports the case of a woman eighty years of age who presented an ulcer on the upper lip, at first not larger than a ten-cent piece, but which, having increased in size progressively, eventually attained a relatively large size. His diagnosis, which was that of epithelioma, was confirmed by several confrères and in addition by the fact that the patient's mother had succumbed to cancer of the liver. The author began treatment with the X rays after having failed to relieve the patient by means of an antiseptic combination of mercuric chlorid solutions and seroform, continued during ten days. The application was made daily for ten minutes, at a distance of fifteen centimeters. At the first sitting the pain disappeared, and following this improvement the ulcer became covered with a scab, which became detached by the use of plain vaselin. After the fifteenth or twentieth sitting the borders of the ulcers, which heretofore had been prominent, became flattened and were no longer indurated. In about three months' time the patient was declared cured.

PERISCOPE.

To Carry Arsenic in Cavity Avoiding the Use of Pressure.—Mix the devitalizing paste rather thin, place a minute drop on a small bit of paper and carry the paper to the cavity with the pliers. Press to place with a burnisher. The paper facilitates adjustment to place and prevents the paste from adhering to the instrument.—C. B. WARNER, *Tri-State Dental Quarterly*.

Die Metal for Modeling Compound Impressions.—In cases where it is impossible to secure a plaster of Paris impression, a die can be obtained from modeling compound by using the following die metal: Bismuth, 48 per cent.; cadmium, 13 per cent.; lead, 19 per cent.; tin, 20 per cent. This can also be poured into wet plaster of Paris with little or no risk.—O. H. SIMPSON, *Dentist's Magazine*.

Silk First—Then the Clamps.—I desire to call attention to the application of one or two ligatures in placing a clamp upon a tooth. One circle of floss silk will prevent the clamp from impinging upon the gum. If the tooth be cone shaped, two circles should be put on; one will prevent the clamp from moving upward, and the other prevent it from jumping off, and there will be saved the pain from impingement.—H. C. REGISTER, *Dental Brief*.

Hints to the Student and the Young Practitioner on Impression Taking.—An upper impression, if properly taken, should adhere with considerable tenacity to the roof of the mouth. Sometimes the patient may imagine it is going to stick there. A few words of pleasure at finding it hold so well will reassure the patient, and enable one to remove it without exhibiting undue haste. In the most obstinate cases it will usually come away if, while you ease it at the side, the patient is asked to go through the act of swallowing.

Just after writing the above, I had a patient from whose mouth the tray would not come for a considerable time, until at last, just as I was beginning to wonder if it were possible for it to stick there altogether, it suddenly came away.—HARRY ROSE, *British Journ. of Dental Science*.

Selection of Lower Impression Trays.—When taking lower impressions, it is not only essential that the tray conform to the arch, but that it should be sufficiently deep at its lingual aspect to take a correct impression of the mylo-hyoid ridges, as it is by the aid that these ridges afford that one is able to secure the required degree of stability.—HARRY ROSE, *British Journ. of Dental Science*.

Why and How Deciduous Teeth Should be Preserved.—Under no condition use arsenous oxid in the removal of pulps from deciduous teeth. Do not attempt to fill the root-canals of such teeth, for it is entirely unnecessary, and will probably be just as unsuccessful. Use chloro-percha to fill the pulp-chamber, or mix some fibers of cotton with thin cement, which will be found to last much longer than cement alone.—H. S. VAUGHN, *Dental Headlight*.

Soldering Flux.—The following formula will be found to make an excellent soldering flux: White vaselin, 3 parts; borax glass, 1 part; chlorophyl, sufficient quantity to color.

The borax glass should be reduced to the finest possible powder and thoroughly incorporated with the vaselin while the latter is slightly warm. In use, apply sparingly with a small brush where the solder is to flow, and coat each piece of solder before applying. Avoid using an excess.—*Exchange*.

Use of Cement for Swaging Gold Inlay Matrices.—Secure an impression of the cavity by using dental lac or modeling composition. Fill the impression with a stiff cement and let it harden. Insert the cement cast thus made in a suitable hand swager, and stamp and swage on it a piece of pure gold plate—about 36-gage—by means of soft unvulcanized rubber. Transfer the matrix to the tooth, and re-burnish it should it not fit accurately. It is then ready to be filled with gold solder to the proper contour. If a platinum matrix has been used, pure gold solder may be employed. If a 22-k. gold matrix is used, a solder that will flow into it without melting the matrix can be used.—E. C. SUMMAN, *Dental Register*.

Setting a Shell Crown.—To get the closest adaptation drill a hole through the thickest part of the cusp, tap it, and fit a piece of threaded gold wire. In setting the crown remove the wire and allow the surplus of cement to escape through the hole; when the cement is nearly hard, clear it away from the hole and screw in the gold wire. When the cement is thoroughly hard cut the wire flush and polish.—R. M. SANGER, *Items of Interest*.

Gutta-Percha for Filling Teeth.—There is no filling material that will take the place of gutta-percha except gold, and there are some places where gold cannot be inserted, and where a good gutta-percha filling will be more serviceable than anything else that could be placed in the cavity. Where there is no friction, no compression from mastication, or no mechanical wear on it, there is no filling that is better than gutta-percha for the universal preservation of teeth.—J. G. REID, *Dental Review*.

Investment Plaster.—Investment plaster of the most reliable and inexpensive kind can be made by any dentist from the following formula: Good quality of ordinary dental plaster, 2 parts; pulverized mica (mica flour), 1 part; marble dust (pulverized), 1 part. (Proportions determined by measure.)

This compound, if carefully and thoroughly mixed to insure uniformity of the mass, will be found specially adapted to every department of the dental laboratory where an investment plaster is required.—H. A. CROSS, *American Dental Journal*.

Gold Inlays and a Few Principles of Cavity Preparation Therefor.—An accurately adapted gold inlay, inserted under heavy pressure with fine cement, showing margins with no visible trace of cement, seals the cavity much more securely than any other filling. Inasmuch as the margins are fairly well beveled, and the inlay consists of an unyielding material which is accurately adapted and sealed with a fine cement, it is evident that the protection of the margins and tooth-walls against breakage is not to be approached by other means.

I will describe the details of procedure which I find most satisfactory in the great majority of cases: Prepare the cavity without undercuts, either by cutting them away or by filling them with cement. Do not, however, leave a saucer-shaped cavity, but have, rather, abrupt walls. Allow a fair degree of bevel to the margins, although they must not be rounded. If an approximal cavity, have

the base incline to a slightly greater depth from the gingival border—or a slight groove running labio-lingually will suffice. As a rule, in a bicuspid or molar, if the cavity be of fair proportions, it will be wise to extend it over into the fissures or sulci on the occlusal surface. This will increase the strength of the inlay very greatly, by thus taking advantage of the hooking and dovetailing principles, allowing the inlay to emerge upon the occlusal surface through a comparatively shallow and narrow channel into a deeper and broader depression. Any depth of cavity, abruptness of walls, or suddenness of depression may be permissible, provided we leave no undercuts.—CLARENCE H. WRIGHT, *Dental Digest*.

How to Make a Fusible Metal Impression of a Single Tooth.—When a dentist desires to make a fusible metal impression of a tooth, he, as a rule, makes a plaster cast taking in several teeth. It is difficult to isolate the individual one for which a cap is desired. To do so with a saw is a slow process, and to cut around the gum margin with a bur causes the bur to clog at once.

I proceed as follows: Make a plaster cap of the tooth and the adjoining teeth. Take a small piece of modeling clay—composition will do, but not nearly so well—and fill the adjoining teeth to the one desired, leaving a surplus above the filled teeth. Now we have the tooth isolated. The metal is poured in, the cast held under water and knocked out of the mold, and the result will be a cast of the single tooth. There is little to be trimmed from the gum margin, and this can be done with a coarse rubber file.—F. B. SPOONER, *Dental Summary*.

A Method of Obtaining Stability of Upper Plates Without the Use of Air-chambers.—There is no greater myth in dentistry than air-chambers. I believe that three-fourths of the men that use them do so because they were used when these men entered the profession. From a mechanical standpoint they are always an element of weakness. Nine upper plates in every ten that are broken through the center are the result of the air-chambers weakening the plates. I believe the theory is that it creates a vacuum. If it does add to the adhesion in this way, it will only be a day or two until the soft tissue in the roof of the mouth will be drawn into this vacuum, and then none exists; thus the effect is only temporary. A much better way is to take a knife or sharp instrument and cut a groove on the palatal

surface of the cast, not over a quarter of an inch from the top of the ridge, extending over the heels to each condyle. This latter serves as a bead to finish the plate to at the heel. Drag a ball burnisher through the line made in the cast by a sharp instrument, thus making a smooth groove or track. This will raise a bead on the plate and make a suction cavity over the greatest area that can possibly be had. It will relieve pressure in the roof of the mouth, and do away with the necessity of trimming the cast or impression. I have never found it necessary to take precaution other than this to guard against hard or soft spots in the mouth. If the plate is warped during the finishing process, this will overcome that in a measure.—O. H. SIMPSON, *Western Dental Journal*.

Gold-Inlay "Don'ts."—Don't guess at the thickness of your matrix metal—use a micrometer. Don't try to fill small cavities with gold inlays. Don't use dirty borax. Don't use anything for a flux except clean, freshly creamed borax. Don't let the solder get through the matrix and on the back of the inlay. Don't try to force your solder to flow with a small flame. Don't smother your work with borax. Don't use low-grade solders. Don't fill your inlays too full. Don't expect too much of gold inlays, and don't be discouraged by failures.—T. P. HINMAN, *Dental Summary*.

A Method of Forming Cusps for Perfect Occlusion in Bridge Work.—Make the abutments for the bridge and place them on the cast, as for any bridge; select the facings for the dummies and grind them to fit the case. Back the facings with platinum 1:1000 gage and fill the space between the abutments with hard pink wax. The wax is now carved to occlude with the opposite teeth and chilled with cold water. Next, take a piece of platinum 1/2000 thick, anneal it, and place it over the wax cusps, allowing the ends to extend a little on the abutments. I now take a piece of vulcanite rubber, dip it into talcum or soapstone, and force the platinum to place—the latter showing all the fine lines in the carved wax. The bridge or crown is now inverted, and invested in any good investment material, allowing the latter to extend as far on the lingual cusp as you wish the length of the lingual cusps to be. The wax is now washed out and 22-k. solder is used in the cusps, finishing with 18 or 20-k. The platinum can be ground off or left on as desired.—E. C. MOORE, *Bur*.

Cutting Out Fissures.—In cutting out fissures in the molars and bicuspid, instead of using fissure burs, use half-inch knife-edge carborundum stones, held on a screw mandrel in the right-angle handpiece, turning the right angle either to the cheek or tongue, whichever will be necessary to prevent the stone from jumping. With the back of the mouth-mirror toward the stone, hold the cheek and tongue out of the way. After cutting the fissure sufficiently in depth and width, bevel the edge by leaning the side of the stone against it, and at the same time undercut the opposite side. Use stone in the handpiece in cutting out palatal fissures in molars. After they are worn down small, use them to cut out short fissures. I have not used a fissure bur for the past ten years. The stones cut much faster, more smoothly, with less pain, and are less expensive.—B. T. RADCLIFF, *Dental Brief*.

Misconceptions Concerning Porcelain: Don't Jar the Body.—It is fatal to the best results and the greatest density of porcelain to jar the body into place, as is usually done. When a mass of wet porcelain is jarred it causes air-bubbles to settle toward the bottom of the mass, and the more it is jarred the larger are the bubbles. This may be proved by placing porcelain on the end of a spatula and jarring it. Then examine it with a magnifying glass, and it will be found full of bubbles near the bottom of the mass. Porcelain should be gently pressed or wiped into place with a spatula, in such a manner as to constitute a burnishing of the material. When built up in this way it is very dense and strong, and there is little shrinkage in fusing it. I seldom find it necessary to fuse a jacket-crown more than once, in any tooth anterior to a molar. I use the highest-fusing body I can get, and have no need for more than four shades.—LOUIS LADEWICH, *Dental Review*.

Methods of Anesthetizing the Pulp.—Isolate the tooth with the rubber dam and clean it with water and alcohol. Excavate the cavity as much as possible, and if the pulp is not exposed, dehydrate it with alcohol and hot air. Saturate a pledget of cotton or a piece of spunk with a cocaine solution, place it in the prepared cavity and cover it with a piece of vulcanizable rubber; then with a suitable burnisher apply slowly increasing, continuous pressure for from one to three minutes. The pulp may now be exposed and

tested. If it is still sensitive, repeat the process. Loeffler states that "This pressure may be applied by taking a short piece of orange-wood; fit it into the cavity as prepared, and direct the patient to bite upon this with increasing force. In this way we can obtain a well-directed, regulated force or pressure, and with less discomfort to the patient and operator."

Miller describes this process as follows:

"After excavating the cavity as far as convenient, and smoothing the borders of it, take an impression in modeling compound, endeavoring to get the margins of the cavity fairly well brought out; put a few threads of cotton into the cavity and saturate them thoroughly with a five to ten per cent. solution of cocaine; cover this with a small bit of rubber dam, and then press the compound impression down upon it. We obtain thereby a perfect closure of the margin, so that the liquid cannot escape, and one can then exert pressure with the thumb sufficient to press the solution into the dentin."—H. PRINZ, *Dental Era*.

Protection for the Dentist Against Specific Infection.—Should the operator inflict even a trivial scratch on himself with an instrument which has become infected by a specific mouth, and which has not been properly disinfected, the result may be highly disastrous. The great advantage of the use of the rubber dam, so far as the patient is concerned, has been already pointed out, but it is when dealing with a mouth which it is known is likely to prove an active source of infection that the protection to the operator is likewise equally great.

If, while operating on what is known to be a dangerous mouth, the dentist has the ill-luck to cut his finger with an elevator or other instrument, as has happened before now with the worst results, what can be done? Until a year or so ago practically nothing.

The published experiments of Metchnikoff and Roux show that it is possible to cause abortion of the chancre following inoculation of syphilitic virus on the eyelid of a chimpanzee, by carrying out mercurial inunction less than one hour after the infecting contact—a curious point being that a solution of sublimate has not the same protective action. The ointment used in the prophylactic process is composed of ten parts of calomel to twenty parts of lanolin.

But a more important question remained, viz, whether what was the case with the monkeys would be the case with man? Many persons aware of these researches offered to allow themselves to be inoculated. Dr.

Metchnikoff chose a young medical student, the grandson of an eminent surgeon, who was preparing his thesis on the prophylaxis of syphilis. He had neither hereditary nor acquired taint of the malady. He was inoculated in the presence of Dr. Queyrat of the Cochin, Dr. Saboureaux of the Pitié, and Dr. Salmon of the Pasteur Institute. Three scarifications with the scalpel were followed by the introduction of the virus. An hour later the inoculated spots were rubbed with the calomel ointment. The same thing was done with a monkey. Neither man nor monkey suffered any evil effects, whereas other monkeys, inoculated at the same time but not treated with the ointment, contracted syphilis. The experimenters discovered, however, that in the case of a monkey the ointment must be applied within twenty hours after inoculation, as otherwise the infection declares itself. Dr. Metchnikoff affirms that if the time-limit is respected, immunity is complete. He has since published letters from the three specialists above mentioned, affirming that the young man inoculated showed—more than three months later—no trace of syphilis, and that he had never had it.—*Dental Surgeon*.

Method of Using Inlay Gold in Making an Open-Face Crown.—Take in plaster the impression of the tooth to be crowned, run a plaster cast, and trim it at the cervical margin carefully, with the view of having the finished crown extend under the free margin of the gum. Take an impression of the plaster tooth in moldine, and run a die in Melotte's metal. Polish the metal die with a cuttlefish disk. Take inlay gold (preferably 24-k. 1/1000), and cut a piece sufficiently large to cover the labial surface, and also one to cover the lingual surface, cutting it large enough to allow for an overlap of 1/32 of an inch at the interdental spaces. With the assistance of slightly softened modeling composition, the inlay gold can be readily adapted to the die. For more perfect swaging, place the two sides of the crown in position on the die, and over this place the metal ring which comes with all moldine outfits, and corresponds to the size of the impression tray. It will rest firmly upon the edges of the die. Fill the ring flush with wet cotton, and pack it down with a wooden piston (home-made), tapping it lightly with an ordinary hammer. Remove the cotton and you will find the two sides of the crown stuck together, and they can be removed from the die without disturbing this relation. Now place the perfectly

swaged crown on an asbestos mat, and with a small piece of 22-k. solder unite the two sides. Place it on the plaster cast and cut out its face with a carborundum stone. Try it on the natural tooth, and with an oval burnisher adapt the margins as you would in making an inlay filling.

We now have a perfect matrix of the tooth to be crowned. Invest it by filling the crown or matrix with investment material—either fine marble dust or sump—bring it to a heat, and flow 22-k. solder over the entire surface. Finish just as you would an inlay filling.—W. H. HOYL, *Items of Interest*.

Cavities for Which Gold Inlays are Indicated.—Gold inlays are indicated in the following places: In large cavities in teeth of children; in teeth that are attacked by chronic interstitial gingivitis or pyorrhea. In those of very nervous people, or in those the muscles of whose jaws are affected by trismus; in those cavities that are inaccessible—accessibility should be the guide in many cavities in deciding between gold foil filling or an inlay; in those the walls of which are too weak to stand the malleting necessary for gold foil, and which are not so far gone as to necessitate crowns. This will include many teeth which in former years it would have been necessary to crown, but which in the hands of the experienced inlay worker can be made to give years of service, and with a much healthier environment than would have been the case had they been fitted with crowns; also in cavities approximating bridge work over which it is impossible to place the rubber dam.—CHARLES E. WOODBURY, *Dentist's Magazine*.

A Few Facts in Connection with Root-Canal Treatment: Therapeutic Value of Creasote.—I believe that good results—shall I say the best result?—in root-canal filling can be obtained by filling with medicaments that are slightly or non-poisonous, non-irritating, and of long-continued antiseptic properties; and that these should be introduced in fluid, semi-fluid, or paste form, or possibly upon a vehicle which absolutely maintains its integrity. Again, that the filling should fill as perfectly as possible in order to prevent the entrance of moisture into the canal, and thus add more material for putrefactive decomposition. Again, the filling should be easy of introduction—not that this is essential, but all else being equal, it is at least desirable. Last, but not least, it should be easy of removal, which attribute, while it is of little consequence at the time of introduction, becomes of paramount importance

to the patient if, in the course of time—say ten to twenty years—it means the long continuance of suffering or the affording of prompt and easy relief. The medicaments of which I can best speak are those which I have used the longest; and I have used none longer and with better results—where it is especially desired to get a result, in difficult cases—than wood creasote.—WILLIAM E. TRUAX, *Items of Interest*.

How to Obtain a Correct Bite.—Perhaps the idea is not a new one at all, but it was to me. Take, for instance, a full upper case—of course it will be the same with any other case—take an impression, run the cast, wax up the case, set on the six anterior teeth by guess, tack on a piece of wax over the ridge where the posterior teeth should be, about the proper height. Then warm the piece of wax over the ridge, try the piece in the mouth, and let the patient bite down, and that will make prints of the lower teeth. You can look in the mouth and see whether the patient closes naturally. Next take an impression—preferably with modeling compound—of the lower teeth, and after preparing the cast, set the latter in the print in the wax that was made by the lower teeth, and fasten both to the articulator. The advantage over the ordinary method of obtaining the bite is that one can readily see if the patient bites correctly. It takes no longer to take the bite in this way.—T. A. LIFSEY, *Dental Summary*.

Joints.—There is nothing more simple in dentistry than to make uniformly white joints. It is not necessary to grind hair-like joints—just grind a good one. Allow no wax to get in the joint; leave an aperture or opening in the beeswax just above this point about the size of a wheat straw; leave another the same size on the inside, just opposite each joint. These openings should connect from behind. In pouring the upper half of the flask, it should be thoroughly jolted, in order to fill the joint from above and below. When the flask is opened and the wax removed the plaster should be scraped off and cut away above and below, to prevent it from making a flaw in the plate. A part of the plaster can be scraped out of the joint. If a joint fails to fill, wet a piece of plaster about the size of a grain of wheat and crush it into the joint as you would amalgam. Do not use powdered plaster—use hard plaster. I have used this method successfully for years, and not one per cent. of my joints are black or clouded.—O. H. SIMPSON, *Western Dental Journal*.

HINTS, QUÉRIES, AND COMMENTS.

CALCIUM CHLORID AS A HEMOSTATIC IN HEMORRHAGE.

[*British Medical Journal*, May 4, 1907.]

THE action of calcium chlorid is rapid if given in sufficiently large doses. I remember being called in the middle of the night to see a medical man suffering from hemorrhage after removal of two lower molars. (He was a victim of chronic leucocythemia.)

Naturally he had tried all the remedies he could think of before sending for me, including adrenalin chlorid and pressure, but bleeding had persisted for twelve hours. I ordered him to take twenty grains of calcium chlorid every hour—now I should order it in one-dram doses. The hemorrhage ceased after the third dose.

Before performing any intranasal operation, I always insist on a patient taking full doses of this drug for three days.

A. STANLEY GREEN, M.B., B.S.

USE OF HYPODERMIC SYRINGE IN HIGH-PRESSURE ANESTHESIA.

IN several cases I have used a hypodermic syringe as a high-pressure syringe for obtunding sensitive dentin, with perfect success.

The syringe should be rather large, and only a few drops of the solution should be drawn into the barrel, in order to make it easy to handle. The point is an ordinary straight hypodermic needle, with the needle part cut off, and the reinforced part sharpened to as fine a point as possible.

With this syringe I have found it possible to obtain perfect contact, and results have been as good as with any high-pressure syringe I have ever seen used.

F. E. HARPER.

North Collins, N. Y.

OBITUARY.

PROFESSOR W. D. MILLER.

DIED, at 1 o'clock Saturday afternoon, July 27th, at the Newark, Ohio, Hospital, from an attack of heart failure following an operation for appendicitis, WILLOUGHBY DAYTON MILLER, Ph.D., D.D.S., M.D., Sc.D.

The brief press announcement of the sudden and unexpected death of Dr. Miller came as a shock to all who read it a few weeks ago, and with the larger publication of the fact among his professional colleagues the crushing weight of this irreparable loss will be felt throughout the entire world.

In the zenith of his career, with judgment ripened by experience, with skill and abilities

trained by long years of study and laboratory investigation, and with energies and enthusiasm renewed by reason of his return to his native land, with a fresh and fruitful field for his activities, the promise of his enlarged usefulness and of higher service to his profession and to humanity seemed bright and sure for many years yet to come; the record of the past seemed to be the earnest of the future. But like lightning from a clear summer sky has come the word, "It is finished," and Miller has answered the summons of the Eternal.

Let us record what we can of this life—of a man so much one of us, and yet, by reason of his wonderful character and attain-

ments, so much alone in the position he had won for himself.

Born August 1, 1853, near Alexandria, Ohio, Dr. Miller received his early education in the public schools of Newark in that state. He was always a bright pupil, studious and quick of apprehension, and an infallible prize-taker. He attended the University of Michigan at Ann Arbor from 1870 to 1875, and was graduated there as B.A., "with eminent rank." During the winter of 1875-76 he visited the University of Edinburgh to attend chiefly the lectures of Tait and Crum Brown on mathematics, physics, and chemistry, and received honorable mention for work in his laboratory and the prize offered by Professor Tait for the best essay on a specified subject. In 1876 he heard the lectures of Von Helmholtz, Kirchhof, Wangerin, etc., at the University of Berlin, but was interrupted in this work by illness, which eventually led to his taking up the study of dentistry—for which purpose he returned to America and matriculated at the Pennsylvania College of Dental Surgery for the session of 1877-78.

The circumstances which led Dr. Miller to the choice of dentistry as a profession instead of a career in science arose naturally out of the conditions surrounding him during his period of attendance upon lectures at the University of Berlin. At that time he formed the acquaintance of Dr. N. S. Jenkins of Dresden and through him met the late Dr. Frank P. Abbot, one of the pioneer American dental practitioners in Europe. A mutual interest ensued which led Dr. Miller to seriously consider the question of adopting dentistry as his life-work—a tendency further developed by a conference with Prof. James Truman, then practicing in Hanover, who advised him to engage in dental study, not only from the standpoint of its desirability as a life-work, but especially because of the need in dentistry of men with the natural aptitudes and the scientific training, particularly in chemistry and physics, such as Dr. Miller possessed; and most fortunately for our profession this advice was favorably received and carried into effect.

In the class of 1877 at the Pennsylvania College of Dental Surgery, Miller instantly attained pre-eminence and excited the admiration of teachers and students alike by his

learning, his quickness of understanding, his studious habits, and his lovable personality. In the spring of 1878, the Department of Dentistry of the University of Pennsylvania having been organized, he transferred his matriculation to that institution, from which he was graduated in the spring of 1879 as D.D.S., receiving the prize for the best essay on "Conservative Treatment of the Dental Pulp." Upon graduation he returned to Germany and began the practice of dentistry with Dr. F. P. Abbot, at the same time continuing his studies at the University of Berlin.

On October 26, 1879, he married Miss Caroline Abbot, daughter of Dr. F. P. Abbot, his professional associate in dental practice.

In 1884 he was made professor of operative dentistry at the newly founded Dental Department of the University of Berlin, being the first American to receive the honor of a professorial appointment in a German university. In 1885 he received the honorary degree of Ph.D. from the University of Michigan. In 1887 he attained the degree of M.D. at the University of Berlin with the predicate *Magna cum laude*. In 1894 he was made Professor Extraordinarius in the medical faculty of the University of Berlin, and about the same period was made a State Examiner for Dentistry in Berlin.

In June 1902 the University of Pennsylvania awarded to him the highest scientific distinction within its gift by conferring upon him its honorary degree of Doctor of Science. On September 28th of last year the German Emperor in a personal letter conferred upon him the title of Geheim Medizinalrat, or Privy Medical Councilor, in recognition of his scientific attainments and the valuable character of his services to science and education.

Dr. Miller was president of the Central Verein Deutscher Zahnärzte, which corresponds to our National Dental Association; of the Unterstützungskasse für Deutsche Zahnärzte, an institution for the support of impecunious colleagues and their families; and of the Fédération Dentaire Internationale, and had recently been elected to the deanship of the College of Dentistry of the University of Michigan.

He was an honorary member of many dental societies both in Europe and America,

and wherever dentistry is known and practiced he was universally recognized as the acknowledged leader of our profession. He was a voluminous writer upon topics in nearly all departments of dental science and its art. It is possible that others may have exceeded him in quantity of literary output, but certain it is that none has produced such a volume of literary work of anything like the same scientific and practical importance. The appended list of his principal contributions will give some idea of the nature of his studies and their versatile character, but even a close and careful reading of them all would by no means convey an adequate idea of the painstaking labor involved in the preliminary preparation of the data involved. As a single example it may be mentioned that in his studies on the "Wasting of Tooth Tissues" which appeared in the early issues of the DENTAL COSMOS for the current year, he informed the writer last summer in Berlin that the preparation of the specimens required over ten thousand hours of attention and work to artificially reproduce this commonly observed defect and to establish the point that it could be produced by the mechanical action of the brush and tooth-powder.

The same painstaking, patient, and persistent search for the truth characterized all of his work. His work on the etiology of dental caries is a classic which remains successfully unchallenged today as the final authority upon the subject which it covers. It was this work which at once brought him into prominence before the scientific world and secured him a position among investigators of the first rank, with a status in the dental profession equivalent to that enjoyed by Pasteur and Koch in medical science.

The luster of his fame as a scientific researcher needs no further illumination than that afforded by his recorded works, and it is in that rôle that he is best known; but our sketch of his life and character would be sadly incomplete without reference to certain other of his characteristic attributes—one of the most important of which was his genius for organization. In the conduct of dental society work and in dealing with all the intricacies of professional relationship his logical mind and his tact, coupled with his winning personality, eminently fitted

him for leadership. Much of the solidarity of the dental professional organization in Germany owes its high development to the influence, both indirect and personal, of Miller, and in an international way his earnest efforts through the agency of the International Dental Federation, as its presiding officer and guiding spirit, have done a wonderful work for good in bringing the dental profession in all countries into more intelligent and harmonious relationship. He was the great leader, and to witness his tactful and graceful direction of a cosmopolitan assemblage of dentists, conducting his work as president with equal facility in three languages, was indeed an inspiration.

These are, however, the public and external features of the man that impressed all who had knowledge of him or the opportunity to observe him in official relations, but they are only imperfect indications of the man himself. The writer of this counts it as one of the privileges of his life that he knew and loved Miller for thirty years, and in all that time had never met anyone who had any other feeling for him than honest affection. It was that which he himself felt for all, and he compelled it in all. With a soul the embodiment of truth, with the tenderness of a woman and the nature and simplicity of a child, he was in harmony with all of God's creatures,—helpful, sympathetic, generous, the idol of his family and his friends,—and toward all his attitude seemed to be a practical realization of the truth that "Liebe erwecket gegenliebe," so that his life was a happy one, and measured by all standards was a success.

Though suddenly brought face to face with the end, he met the issue with that calm courage which characterizes the hero. When the attack of appendicitis came on, it was at first not deemed necessary to operate; in fact, it was his wish upon his wife's account to postpone it if possible. In a few days the attack became more acute and he was taken to the hospital at Newark, Ohio. The operation took place on the 22d of July, and was an exceedingly serious one, gangrene having set in. For days he made an heroic struggle for life, enduring intensely uncomfortable positions for long periods in order that the wound might heal under the best possible conditions. No word of com-

plaint passed his lips. He was firmly determined to get well, and until the very last did not know that he was to go. His devoted wife reached him the day after the operation. The wound was successfully cleaned and had begun to heal nicely; however, in spite of all efforts, on the evening of Friday July 26th he became unconscious, and at 1 o'clock on the afternoon of the following day he passed away.

The fact is very impressive that up to the very last he gave evidence of firm belief in the life hereafter. Neither his occupation nor the atmosphere of skepticism in which he lived had shaken his Christian faith.

His remains were interred in the family burial lot at Alexandria, Ohio.

He is survived by his widow and three children—a son and two daughters.

A fairly complete list of his published works is here added:

- "Electrische Vorgänge im Munde." *Deut. med. Wochenschr.*, 1881.
- "Electrical Phenomena in the Human Mouth." *Independent Practitioner*, 1883.
- "Der Einfluss der Mikroorganismen auf die Caries der menschlichen Zähne." *Klebs' Archiv f. experiment. Pathologie u. Pharmakologie*, 1882.
- "Ueber Leptothrix gigantea." *Berichte der Botanischen Gesellsch.*, 1883.
- "Caries of the Human Teeth." *Independent Pract.*, 1883.
- "Dental Caries." *Independ. Pract.*, 1883.
- "Prehistoric Teeth." *Independ. Pract.*, 1883.
- "Agency of Acids in the Production of Caries." *Cosmos*, 1883.
- "Ueber die Caries der Zähne." *Corresp.-bl. f. Zahnärzte*, 1884.
- "Fermentation in the Human Mouth." *Independ. Pract.*, 1884.
- "Biological Studies of the Fungi of the Human Mouth." *Independ. Pract.*, 1884.
- "Tin and Gold Combined as a Filling Material, Electrically and Practically Considered." *Independ. Pract.*, 1884; *Corresp.-bl. f. Zahnärzte*, 1884.
- "Reply to Views of Putrefactive Theory of Decay." *Independ. Pract.*, 1884.
- "Gährungsvorgänge im menschlichen Munde." *Deut. med. Wochenschr.*, 1884.
- "Herbst's New Method of Filling Teeth." *Independ. Pract.*, 1884.
- "Practical Experiments in the Use of Oxyphosphate Cements." *Independ. Pract.*, 1885.
- "A Discussion of Questions in Dental Caries." *Independ. Pract.*, 1885.
- "Zur Kenntniss der Bacterien in der Mundhöhle." *Deut. med. Wochenschr.*, 1885.
- "A Comma Bacillus in the Human Mouth." *Independ. Pract.*, 1885.
- "Amalgam Solvents." *Independ. Pract.*, 1885.
- "A Case in Practice." *Independ. Pract.*, 1885.
- "Gastrotomy for Removal of an Artificial Denture." *Independ. Pract.*, 1885.
- "A New Comma Bacillus." *Independ. Pract.*, 1885.
- "On the Availability of Certain Antiseptics in the Prophylactic Treatment of the Oral Cavity." *Independ. Pract.*, 1885; *Corresp.-bl. f. Zahnärzte*, 1885.
- "Proliferation of Epithelium in Alveolar Abscess." *Independ. Pract.*, 1885.
- "Ueber die Anwendung von Cocaïn." *Corresp.-bl. f. Zahnärzte*, 1885.
- "Pasteur's Methode der Behandlung der Hundswuth." *Deut. med. Wochenschr.*, 1886.
- "Gährungsvorgänge im Verdauungstraktus." *Deut. med. Wochenschr.*, 1886; *Independ. Pract.*, 1886.
- "Gasbildende Spaltpilze, ihr Schicksal im Magen." *Deut. med. Wochenschr.*, 1886; *Independ. Pract.*, 1886.
- "The Density of Teeth as Influenced by the Food and by the Administration of Lime Salts." *Independ. Pract.*, 1886.
- "Zahnschmerzen u. Zahnpflege." *Deut. med. Wochenschr.*, 1886.
- "Wörterbuch der Bakterienkunde." 1886. (43 pages.)
- "Notes on the Decay of the Human Teeth." *Independ. Pract.*, 1886.
- "Testing the Power of Antiseptics." *Independ. Pract.*, 1886.
- "Ueber den Stand der Kenntnis der parasitären Krankheiten der Mundhöhle u. d. Zähne." *Centralbl. f. Bakteriologie u. Parasitenkunde*, 1887.
- "Einfluss der Nahrung auf die Zähne." *Deut. Monatsschr. f. Zahnheilk.*, 1887.
- "Weiderherstellung der Contour cariös gewordener Zähne durch Porzellanstückchen." *Oesterr.-Ungar. Vierteljahrschr. f. Zahnheilkunde*, 1887; *Dental Record*, 1887.
- "Absorption of Dentin: Its Relation to the Process of Reimplantation and to Decay of the Teeth." *Independ. Pract.*, 1887.
- "Gangrenous Tooth-pulps as Centers of Infection." *Cosmos*, 1888.
- "On the Combination of Tin and Gold as a Filling Material." *Dental Record*, 1888.

- "Zahnheilkunde in Vorträgen," 1887. (91 pages.)
- "Attempt to Construct an Antiseptic Mouth-wash." *Independ. Pract.*, 1888.
- "Chromogenic Bacteria of the Human Mouth." *Independ. Pract.*, 1888.
- "Dental Education in Germany." *Independ. Pract.*, 1888.
- "Pathogenic Bacteria of the Human Mouth." *Independ. Pract.*, 1888.
- "Infektion der kranken oder nekrotischen Pulpa auf dem Wege der Blutbahn." *Oesterr.-Ungar. Vierteljahrsschr.*, 1889.
- "Pathologische Erscheinungen am Elfenbein." *Deut. Monatsschr. f. Zahnheilkunde*, 1889.
- "Antiseptic Action of Filling Materials." *Cosmos*, 1889.
- "Mittheilung über das Vorkommen von Eisen in den Zahngeweben." *Verhandl. d. Odontol. Gesellschaft*, 1890.
- "Action of the Peroxid of Hydrogen upon the Teeth." *Cosmos*, 1890; *Corresp.-bl. f. Zahnheilkunde*, 1890.
- "Experiments on the Comparative Value of Various Antiseptics in the Treatment of the Teeth." *Cosmos*, 1890.
- "Studies on the Anatomy and Pathology of the Tusks of Elephants." *Cosmos*, 1890-91.
- "The Micro-organisms of the Human Mouth," 1890. (364 pages.) Second German edition, 1892.
- "The Decomposition of the Contents of the Dentinal Tubules as a Disturbing Factor in the Treatment of Pulpless Teeth." *Cosmos*, 1890.
- "Bacteria of the Air as a Disturbing Factor in Dental and Surgical Operations." *Internat. Dental Journal*, 1891.
- "Die Verbindung von Zinn und Gold als Füllungs-material für Zähne." *Corresp.-bl. f. Zahnärzte*, 1891.
- "Bacteriology as an Integral Part of the Dental Curriculum." *Cosmos*, 1891.
- "Concerning Oxyphosphate Cements." *Cosmos*, 1891.
- "Decay of a Replanted Tooth." *Cosmos*, 1891; *Oesterr.-Ungar. Vierteljahrsschr.*, 1891.
- "On the Comparative Rapidity with which Different Antiseptics Penetrate Decalcified Dentin." *Cosmos*, 1891.
- "Disinfection of Dental and Surgical Instruments." *Cosmos*, 1891; *Verhandl. d. Odontol. Gesellsch.*, 1891.
- "The Human Mouth as a Focus of Infection." *Cosmos*, 1891.
- "Concerning Combined Fillings." *Cosmos*, 1892.
- "Microscopical Examination of a Case of Caries of a Monkey's Tooth." *Cosmos*, 1892.
- "Concerning Various Methods for Obviating the Necessity of Extracting Devitalized Tooth-pulps." *Cosmos*, 1893.
- "Caries der Thierzähne." *Verhandl. d. Odontol. Gesellsch.*, 1893.
- "Asepsis and Antiseptics in Practice." *Cosmos*, 1893.
- "Caries of Teeth of an African Manatee." *Cosmos*, 1893.
- "The Iodoform Question." *Cosmos*, 1893.
- "Experimentelle Untersuchung über Kupfer-Amalgam und Amalgam-Cemente." *Corresp.-bl. f. Zahnärzte*, 1894. (Miller and Jung.)
- "Die Bakterio-Pathologie der Zahnpulpa." *Corresp.-bl. f. Zahnärzte*, 1894.
- "An Introduction to the Study of the Bacterio-Pathology of the Dental Pulp." *Cosmos*, 1894; *Verhandl. d. Odontol. Gesellsch.*, 1894. (41 pages, 3 plates.)
- "Experiments Relative to the Form in which Arsenous Acid may be best applied for Devitalizing Tooth-pulps." *Cosmos*, 1894.
- "Remarks on the Communication of Dr. Röse." *Cosmos*, 1894.
- "Deposits upon the Teeth, with Special Reference to Green and Metallic Deposits." *Cosmos*, 1894; *Corresp.-bl. f. Zahnärzte*, 1894. (35 pages, 1 chromolith. plate.)
- "Adaptability of Cohesive and Non-cohesive Golds under Pressure." *Ohio Dental Journal*, 1895.
- "Transparent Zone in Decay of the Teeth." *Trans. Odont. Soc. Great Britain*, 1896.
- "Lehrbuch der conservierenden Zahnheilkunde," 1896. (Second ed. 1898. 462 pages.)
- "Caries of an Unerupted Tooth." *Cosmos*, 1898; *Deut. Monatsschr. f. Zahnärzte*, 1898.
- "Effect of Heat on Dentin." *Ohio Dental Journal*, 1899.
- "Some Very Rare Cases of Gunshot and Spear Wounds in the Tusks of Elephants." *Cosmos*, 1899.
- "Das Füllen der Zähne mit Porzellan." *Odontol. Blätter*, 1899.
- "Ueber den Bau des Molaren von *Elephas Indicus*." *Deut. Monatsschr. f. Zahnheilkunde*, 1900.
- "Die Bakterio-Pathologie der Zahnpulpa." *Odontol. Blätter*, 1900.
- "On Recurrent (So-called Secondary) Caries of the Teeth, with Special Reference to the Electrical Theory." *Cosmos*, 1900.

- "Some Recent Contributions to the Study of Decay of the Teeth." COSMOS, 1900.
- "On a Pathogenic Yeast-Fungus Found in the Oral Cavity." COSMOS, 1900; *Journ. Brit. Dental Association*, 1900.
- "On Certain Preparations of the Jaws and Teeth, and the Methods Employed in Making Them." COSMOS, 1901.
- "A Study of Some Dental Anomalies with Reference to Eburnitis." COSMOS, 1901.
- "Pathological Processes in an Unerrupted Tooth." COSMOS, 1901.
- "Disinfection of Dental Instruments by Means of Spirit of Soap." COSMOS, 1901.
- "The Presence of Bacterial Plaques on the Surface of the Teeth, and Their Significance." COSMOS, 1902.
- "Further Experiments Relating to the Question of Immunity." COSMOS, 1903.
- "The Question of the Transparency of the Dentin." COSMOS, 1903.
- "Introduction to the Study of Immunity in Its Relation to Diseases of the Mouth and Teeth." COSMOS, 1903.
- "Introduction to the Study of Immunity in Its Relation to the Diseases of the Mouth and Teeth." *Journ. Brit. Dental Association*, 1903.
- "A Study of Certain Questions Relating to the Pathology of the Teeth." COSMOS, 1904.
- "Disinfection of Dental Instruments with Formaldehyd." COSMOS, 1904.
- "Notes on the Erosion of the Teeth." COSMOS, 1904.
- "Further Experiments Relating to the Question of Immunity." *Journ. Brit. Dental Association*, 1904.
- "Deficiency of Calcium Salts as the Chief Cause of Caries." COSMOS, 1905.
- "Preventive Treatment of the Teeth, with Special Reference to Silver Nitrate." COSMOS, 1905; *Journ. Brit. Dental Association*, 1905.
- "Pathological Processes in Extra-Oral Teeth." COSMOS, 1905.
- "New Theories Concerning Decay of the Teeth." COSMOS, 1905.
- "A Study of Certain Questions Relating to the Pathology of the Teeth." COSMOS, 1905.
- "Symbiosis, with Particular Reference to the Bacteria of the Alimentary Canal." COSMOS, 1906.
- "Experiments and Observations on the Wasting of Tooth Tissue Variously Designated as Erosion, Abrasion, Chemical Abrasion, Denudation, etc." COSMOS, 1907.
- "Further Investigations of the Subject of Wasting." COSMOS, 1907.

"IN MEMORIAM" RESOLUTIONS.

The following resolutions were presented by Hofrat Dr. N. S. Jenkins and unanimously adopted by the "W. D. Miller Dental Club," Berlin, Germany, at a special meeting held August 6th:

Whereas, Geheim Medizinalrat Professor Dr. Willoughby D. Miller, the great scientist and beloved friend for whom our club was named, has been removed by death; therefore,

RESOLVED, That in common with all the members of our profession we deeply mourn our irreparable loss; and

RESOLVED, That as we were united to him not only by the admiration and respect which his scientific work spontaneously evolved, but also by the ties of warm personal friendship, we hereby pledge ourselves to cherish forever the memory of his example, which shall inspire us to higher devotion to our profession, to broader charity, to nobler living, and to deeper compassion toward suffering humanity, whom he served so well and so unselfishly.

GEO. O. WEBSTER, *President*,
E. D. BARROWS, *Secretary*.

SOCIETY NOTES AND ANNOUNCEMENTS.

[JAMESTOWN EXPOSITION, NORFOLK, VA.,
1907.]

JAMESTOWN DENTAL CON- VENTION,

TO BE HELD AT

Norfolk, Va., Sept. 10-12, 1907.

Committee of Organization.

BURTON LEE THORPE, 305 N. Grand ave.,
St. Louis, Mo., *Chairman.*

THOS. P. HINMAN, Atlanta, Ga., *Vice-
chairman.*

F. W. STIFF, 600 E. Grace st., Richmond,
Va., *Treasurer.*

H. WOOD CAMPBELL, Suffolk, Va., *Secretary.*

R. H. WALKER, Norfolk, Va.

J. E. CHACE, Ocala, Fla.

CLARENCE J. GRIEVES, Baltimore, Md.

THE Jamestown Dental Convention will be held in a specially equipped building on the Exposition grounds which was built for the purpose of accommodating this convention. The building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits, and all of these, except surgical clinics, will be held in it. The entrance is outside of the grounds, thus saving admission fee to enter it; access, however, to the grounds is possible without leaving the hall. The building is wired with both direct and alternating current, equipped with running water, is well lighted, and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce bldg., Norfolk, Va. To him exhibitors should apply at once for space—price per foot and a plan of the hall will be sent upon request.

To expedite the work before the general sessions, all resolutions, motions, and routine business must first be submitted to the Com-

mittee on Organization, who at the proper time will present them to the general body.

The clinics at the convention are under the supervision and direct control of Dr. C. J. Grieves, Park and Madison aves., Baltimore, Md. His assistants are Drs. Baskerville Bridgeforth, Richmond, Va., E. J. Tucker, Roxboro, N. C., Herbert Johnson, Macon, Ga., F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistant clinic chairmen have been appointed in each state in the Union and near countries, viz, Canada, Mexico, Cuba, and Hawaii. From these come reports of the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various states and countries. Names of these and the clinic chairmen are given with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace st., Richmond, Va., who reports memberships rapidly coming in.

The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. (See communication as to hotel accommodations printed below, also prices following it.)

A cordial invitation is extended to all ethical dentists to become members and attend the convention.

The membership fee is five dollars, which will entitle members to receive a bound copy of the proceedings. A half-rate—\$2.50—is made to *bona fide* dental students upon certificates from the deans of their colleges, and when presented to the state chairman of the Membership Committee for indorsement and acceptance will entitle them to the rights and privileges of the convention.

Dr. E. P. Beadles was elected by the Committee on Organization in February to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention.

SPECIAL NOTICE TO CLINICIANS.

The membership fee includes a copy of the proceedings of the convention in bound form, but to insure representation clinicians must furnish the chairman of Clinic Committee with a detailed description of their respective demonstrations.

Hotel Accommodations.

[Communication from the Virginia members of the Committee of Organization.]

NORFOLK, VA., June 24, 1907.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In view of the statements that have gone out in relation to the lack of accommodation and high hotel charges in the vicinity of the Jamestown Exposition, we, the Virginia members of the Organization Committee of the Jamestown Dental Convention, deem it wise to make a formal statement of the situation, that the members of the profession who contemplate attending the Convention at the Jamestown Exposition, Norfolk, Va., September 10-12, 1907, may not be misled or deterred in their purpose:

While at this time the Exposition is not entirely completed, it presents a very attractive appearance and is well worth seeing, and by the date set for the convention it will not only be fully completed but will be at the very height of its perfection.

Aside from any attraction that is offered by the Exposition, the assembling in Hampton Roads of the fleets of the nations of the world is amply worth the trip to the Jamestown Exposition.

The Jamestown Exposition grounds are not located in any one city but are nearly equidistant from the tidewater cities of Norfolk, Portsmouth, Newport News, Hampton, and Old Point Comfort, and within thirty minutes' ride by rail or water of any one of them.

The hotels and cottages of the summer resorts of Buckroe Beach, Ocean View, Wil-

loughby Beach, Cape Henry, and Virginia Beach will be utilized for the accommodation of visitors.

The suburbs of Norfolk, Portsmouth, and Newport News—such as West Norfolk, Port Norfolk, South Norfolk, Berkley, Riverside, River View, Edgewater, Lambert's Point, and Parke Place—have many comfortable homes that will be open to receive guests, and are all well connected with electric lines of street railway to points of departure for the Exposition grounds.

We append a list of some of the leading hotels and their rates per day. In order to secure these rates it will be necessary to make reservations not later than August 15th.

The Inside Inn, with a capacity of 3000 persons, will be the official headquarters of the convention. The following are the rates of the Inside Inn:

INSIDE INN.

European plan, without bath, two persons in a room, which includes breakfast, privileges of the inn, and admission to the grounds after the guest has registered at the hotel, \$2.50 per day for each person. If room is occupied by only one person, the rate is \$3.50 per day. American plan, without bath, two persons in a room, which includes breakfast, privileges of the inn, luncheon, and our \$1.00 evening *table d'hôte* dinner with wine, admission to the grounds after the guest has registered at the hotel, \$3.50 per day for each person. If room be occupied by only one person, the rate is \$4.50.

The rates for rooms fronting the sea, or the sea and pine grove: American plan. If room be occupied by only one person the rate will be \$6.00 per day. If room be occupied by two persons the rate is \$8.00 for the two. American plan, with bath and toilet, \$8.00 per day for one person in a room, if room is occupied by two persons the rate is \$10.00 for the two.

The following is a partial list of Norfolk and Portsmouth hotels:

NORFOLK.

Algonquin Hotel, Granby st. and College place, \$1.00 per day and up.

Atlantic Hotel, Main and Granby sts., \$1.00 per day and up.

Colonial Hotel, 202 Granby st., \$1.00 per day and up.

Hotel Fairfax, City Hall ave. and Randolph st., \$1.50 per day and up.

The Monticello, City Hall ave. and Granby st., \$1.50 per day and up.

Gladstone Hotel, Main and Nebraska sts., \$1.00 per day and up.

Haddington Hotel, Granby st. and City Hall ave., \$1.00 to \$3.00 per day.

Hotel Savoy, Granby st. and City Hall ave., \$1.00 to \$3.00 per day.

Carolina Hotel, Atlantic and Plume sts., \$1.00 per day and up.

St. Denis Hotel, Main st. and Roanoke ave., \$1.00 per day and up.

Terminal Hotel, Plume and Atlantic sts., \$1.00 per day and up.

Henry Seelinger, 39-41 City Hall ave.

Lynnhaven Hotel, Freemason and Granby sts., \$2.50 per day and up.

Union Hotel, 35 Brewer st., \$0.50 per day and up.

Stag Hotels.

The Lee Stag Hotel, 97 Bank st., \$1.00 per day and up.

McDonalds, Main st. and Commercial Place, \$1.00 per day and up.

Victoria, 359-361 Main st., \$1.50 per day and up.

Henry Seelinger, 39-41 City Hall ave.

PORTSMOUTH.

Hotel Monroe, Court and High sts., \$1.00 per day and up.

Hotel Fairfax, Crawford and High sts., \$1.00 per day and up.

Pearson Hotel, High and Water sts., \$1.25 per day and up.

In addition to the hotels named, there are hundreds of private boarding-houses and rooming-houses, at which visitors may secure accommodations at reasonable rates.

Yours very truly,

R. H. WALKER, Norfolk, Va.

F. W. STIFF, Richmond, Va.

H. W. CAMPBELL, *Sec'y,*
Organization Committee.

[Transportation rates will be found on page 1022.]

Program.

TUESDAY, September 10th.

9.30 A.M.

Meeting called to order by the chairman of the Committee of Organization, Dr. Burton Lee Thorpe, St. Louis, Mo.

Invocation—Rev. Dr. C. L. Bane, pastor Memorial M. E. Church, Norfolk, Va.

Address of welcome—Hon. Harry St. George Tucker, president of the Jamestown Exposition.

Address of welcome in behalf of the profession of Virginia—Dr. Joseph W. Eggleston, Richmond, Va.

Address of welcome—Dr. Edward Eggleston, Richmond, Va., president of the Virginia State Dental Association.

Address of welcome—Dr. W. G. Mason, Tampa, Fla., president Southern Branch, N. D. A.

Address of welcome in behalf of the profession of the South—Dr. J. Y. Crawford, Nashville, Tenn.

Response to addresses of welcome—Dr. J. D. Patterson, Kansas City, Mo.

Address by the president—Dr. V. E. Turner, Raleigh, N. C.

2.30 P.M.

Clinics in Convention Hall. Dr. Clarence J. Grieves, chairman, Baltimore, Md.

8 P.M.

Smoker at Inside Inn. Dr. B. Holly Smith, chairman, Baltimore, Md.

WEDNESDAY, September 11th.

9.30 A.M.

Illustrated lecture—Dr. F. T. Van Woert, Brooklyn, N. Y.: "Is the Cemented Filling the Filling of the Future?"

Discussion opened by Drs. Wm. K. Slater, Knoxville, Tenn., and Craig M. Work, Ottumwa, Iowa.

11 A.M.

Illustrated lecture—Dr. Chas. L. Alexander, Charlotte, N. C.: "Gold Inlays."

Discussion opened by Drs. H. H. Johnson, Macon, Ga., and J. G. Fife, Dallas, Tex.

2.30 P.M.

Clinics in Convention Hall.

9.30 A.M.

Illustrated lecture—Dr. R. Ottolengui, New York, N. Y.: "The Purposes and Accomplishments of Modern Orthodontia."

Discussion opened by Drs. W. O. Talbot, New Orleans, La., and Henry W. Morgan, Nashville, Tenn.

THURSDAY, September 12th.

9.30 A.M.

Clinics in Convention Hall.

2.30 P.M.

Special clinical lecture and demonstration—Dr. Wm. H. Taggart, Chicago, Ill.: "Cast Gold Inlays, Bridges, and Plates."

Discussion opened by Drs. J. H. Lorenz, Atlanta, Ga., and L. E. Custer, Dayton, Ohio.

8 P.M.

Entertainment to members and guests of the convention, by the Virginia State Dental Association, under the chairmanship of its president, Dr. Edward Eggleston, Richmond, Va.

Adjournment.

Officers.

The following officers have been elected by the Committee of Organization:

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.

President—Dr. V. E. Turner, Raleigh, N. C.

First Vice-president—Dr. B. Holly Smith, Baltimore, Md.

Secretary-general—Dr. Geo. F. Keesee, Richmond, Va.

Treasurer—Dr. Mark F. Finley, Washington, D. C.

Chairman of General Clinic Committee—Clarence J. Grieves, Park and Madison aves., Baltimore, Md.

Chairman of General Membership Committee—F. W. Stiff, Richmond, Va.

Vice-presidents—Chas. L. Alexander, Charlotte, N. C. R. R. Andrews, Cambridge, Mass. Waldo E. Boardman, Boston, Mass.

Wm. M. Bebb, Los Angeles, Cal. G. V. Black, Chicago, Ill. Edwin C. Blaisdell, Portsmouth, N. H. F. A. Blanchard, Marksville, La. George W. Boynton, Washington, D. C. Truman W. Brophy, Chicago, Ill. Geo. V. I. Brown, Milwaukee, Wis. H. J. Burkhart, Batavia, N. Y. Chas. S. Butler, Buffalo, N. Y. Wm. Carr, New York, N. Y. Arthur W. Chance, Portland, Ore. Norris R. Cox, Portland, Ore. Wm. Crenshaw, Atlanta, Ga. W. A. Cudworth, Milwaukee, Wis. L. E. Custer, Dayton, Ohio. W. G. Dalrymple, Ogden, Mo. Edwin T. Darby, Philadelphia, Pa. John W. David, Corsicana, Tex. A. J. Derby, Honolulu, Hawaii. Max M. Eble, Louisville, Ky. Edward Eggleston, Richmond, Va. L. C. Elkins, St. Augustine, Fla. W. Leon Ellerbeck, Salt Lake City, Utah. W. W. Evans, Washington, D. C. J. Falero, City of Mexico, Mex. Geo. L. Field, Detroit, Mich. Ricardo Figueroa, City of Mexico, Mex. R. D. Griffin, Paris, Tex. Chas. L. Gunn, Gadsden, Ala. J. A. Hall, Collinsville, Ala. T. M. Hampton, Helena, Mont. Geo. Edwin Hunt, Indianapolis, Ind. Chas. F. Irwin, Vancouver, Washington. S. H. Johns, Wilmington, Del. H. H. Johnson, Macon, Ga. S. F. Kemp, Key West, Fla. H. F. King, Fremont, N. H. D. O. M. LeCron, St. Louis, Mo. Wilbur F. Litch, Philadelphia, Pa. Geo. E. Longeway, Gt. Falls, Mont. A. A. McClanahan, Springfield, Tenn. T. T. McClanahan, Nashville, Tenn. A. C. McCurdy, Towson, Md. L. B. McLaurin, Natchez, Miss. James McManus, Hartford, Conn. D. J. McMillen, Kansas City, Mo. W. G. Mason, Tampa, Fla. Chas. A. Meeker, Newark, N. J. A. S. Melendy, Knoxville, Tenn. T. M. Milam, Little Rock, Ark. J. H. E. Milhous, Blackville, S. C. W. D. Miller, Berlin, Ger. Geo. E. Mitchell, Haverhill, Mass. T. T. Moore, Columbia, S. C. Garrett Newkirk, Pasadena, Cal. L. G. Noel, Nashville, Tenn. W. E. Norris, Charlottesville, Va. J. R. Osborne, Shelby, N. C. R. Ottolengui, New York, N. Y. F. A. Shotwell, Rogersville, Tenn. J. D. Patterson, Kansas City, Mo. A. H. Peck, Chicago, Ill. R. W. Quarles, Van Buren, Ark. H. C. Register, Philadelphia, Pa. D. N. Rust, Washington, D. C. R. M. Sanger, Orange, N. J. A. C. Searl, Owatonna, Minn. Alton H. Thompson, Topeka, Kan. Pitt S. Turner, Belton, Tex. Geo. S. Vann, Gadsden, Ala.

F. T. Van Woert, Brooklyn, N. Y. Andreas C. Weber, Havana, Cuba. E. K. Wedelstaedt, St. Paul, Minn. Geo. H. Wilson, Cleveland, Ohio. John E. Woodward, New Orleans, La. C. M. Work, Ottumwa, Iowa.

Clinics.

General Clinic Committee. Clarence J. Grieves (chairman), Park and Madison aves., Baltimore, Md. Baskerville Bridgeforth, Richmond, Va. E. J. Tucker, Roxboro, N. C. H. Herbert Johnson, Macon, Ga. F. A. Bowles, Washington, D. C. Joseph T. Meadors, Nashville, Tenn.

STATE CHAIRMEN FOR CLINICS.

Alabama. L. A. Crumly, Hood bldg., Birmingham.

Arkansas. Chas. Richardson, Fayetteville.

California. Frank L. Platt, 712 Steiner st., San Francisco.

Connecticut. Chas. McManus, 80 Pratt st., Hartford.

Colorado. W. E. Sinton, El Paso bldg., Colorado Springs.

Delaware. C. R. Jeffries, New Century bldg., Wilmington.

District of Columbia. H. J. Allen, 303-04 Colorado bldg., Washington.

Florida. Carroll H. Frink, Fernandina.

Georgia. A. M. Jackson, Macon.

Idaho. J. B. Burns, Payette.

Indian Territory—S. E. Long, South McAlester.

Indiana. Carl D. Lucas, Willoughby bldg., Indianapolis.

Iowa. C. M. Work, Ottumwa.

Kansas. Frank O. Hetrick, Ottawa.

Kentucky. E. D. Rose, Bowling Green.

Louisiana. Jules J. Sarrazin, New Orleans.

Maine. H. A. Kelley, 609 Congress st., Portland.

Maryland. George E. Hardy, Baltimore.

Michigan. E. B. Spalding, 4 Adams ave., West Detroit.

Massachusetts. C. W. Rodgers, Dorchester.

Minnesota. J. W. S. Gallagher, Winona.

Mississippi. W. R. Wright, Jackson.

Missouri. E. P. Dameron, DeMenil bldg., St. Louis.

Montana. G. E. Longeway, Great Falls.

Nebraska. H. A. Shannon, Lincoln.

Nevada. J. C. Hennessy, Reno.

New Hampshire. John W. Worthen, Concord.

New Jersey. C. W. F. Holbrook, 2 Saybrook place, Newark.

New York. Wm. Dwight Tracy, New York.

North Carolina. J. A. Gorman, Asheville.

North Dakota. C. L. Rose, Fargo.

Ohio. H. C. Brown, 185 E. State st., Columbus.

Oklahoma. Theo. P. Bringhurst, Shawnee.

Oregon. Arthur W. Chance, Dekum bldg., Portland.

Pennsylvania. H. B. McFadden, 3505 Hamilton ave., Philadelphia.

Rhode Island. Dennis F. Keefe, 315 Butler Exchange, Providence.

South Carolina. Thomas T. Moore, Jr., Columbia.

South Dakota. E. S. O'Neil, Canton.

Tennessee. A. J. Cottrell, Knoxville.

Texas. John W. David, Corsicana.

Utah. William Leon Ellerbeck, 21 Hooper bldg., Salt Lake City.

Vermont. E. O. Blanchard, Randolph.

Virginia. R. L. Simpson, Richmond.

Washington. C. A. Custer, Chapin block, Seattle.

West Virginia. F. L. Wright, Wheeling.

Wisconsin. W. A. Cudworth, Milwaukee.

Mexico. J. Falero, 18 Tacuba, City of Mexico.

Cuba. Andres G. Weber, Corales, 1 Esquina Egido, Havana.

Hawaii. A. J. Derby, Honolulu.

Membership.

General Membership Committee. F. W. Stiff (chairman), 600 East Grace st., Richmond, Va. A. S. Melendy, Knoxville, Tenn. Wm. Crenshaw, Atlanta, Ga. M. S. Merchant, Mason bldg., Houston, Tex.

STATE CHAIRMEN FOR MEMBERSHIP.

Alabama. C. S. Gunn, Gadsden.

Arkansas. T. M. Milam, Mann bldg., Little Rock.

California. J. Lorenz Pease, Oakland.

Connecticut. Frederick T. Murlless, Jr., Windsor Locks.

Colorado. Henry F. Hoffman, 612 California bldg., Denver.

Delaware. S. H. Johns, Wilmington.
District of Columbia. Wm. N. Cogan, Washington.

Florida. F. E. Buck, Jacksonville.

Georgia. Walter G. Miller, Augusta.

Idaho. J. H. Lewis, Nez Perce.

Illinois. Frederick B. Noyes, Stewart bldg., Chicago.

Indiana. Fred. R. Henshaw, Middletown.

Indian Territory. J. M. Staples, Atoka.

Iowa. F. T. Breene, Iowa City.

Kansas. F. C. Corey, Council Grove.

Kentucky. A. B. Dixon, Glasgow.

Louisiana. C. Victor Vignes, Machecha bldg., New Orleans.

Maine. Will S. Payson, Castine.

Maryland. W. C. Foster, 9 West Franklin st., Baltimore.

Massachusetts. Waldo E. Boardman, 419 Boylston st., Boston.

Michigan. Albert L. LeGro, 271 Woodward ave., Detroit.

Minnesota. James E. Weirick, St. Paul.

Mississippi. A. E. Tillman, Vicksburg.

Missouri. D. O. M. Le Cron, Mo. Trust bldg., St. Louis.

Montana. T. M. Hampton, Helena.

New Jersey. Alphonso Irwin, Camden.

Nebraska. E. H. Bruening, Omaha.

New Hampshire. H. P. Baldwin, Manchester.

New York. H. Clay Ferris, 1166 Dean st., Brooklyn.

North Carolina. C. A. Bland, Charlotte.

Ohio. L. P. Bethel, Columbus.

Oklahoma. G. L. White, Oklahoma City.

Oregon. George H. Nottage, Portland.

Pennsylvania. Howard E. Roberts, 1517 Locust st., Philadelphia.

Rhode Island. Albert L. Midgley, 312 Butler Exchange, Providence.

South Carolina. L. P. Dotterer, Charleston.

South Dakota. G. W. Collins, Vermilion.

Tennessee. Justin D. Towner, Memphis.

Texas. Rufus W. Carroll, Beaumont.

Utah. W. G. Dalrymple, Ogden.

Vermont. K. L. Cleaves, Montpelier.

Virginia. Wm. Pilcher, Petersburg.

Washington. F. J. Shaw, Burke block, Seattle.

West Virginia. Chas. H. Bartlett, Parkersburg.

Wisconsin. W. H. Mueller, Madison.

Mexico. Ricardo Figueroa, 1 Calle de Santo Domingo 8, City of Mexico.

Canada. Theodore C. Trigger, St. Thomas, Ontario.

Hawaii. E. L. Hutchinson, Honolulu.

The clinics and exhibits at the Jamestown Convention are to be its interesting features.

Manufactures Exhibit.

The Committee on Manufactures Exhibit—Dr. John Manning, Norfolk, Va.—will show the latest and best dental instruments, appliances, machinery, furniture, and materials.

Orthodontia Exhibit.

Dr. Harry E. Kelsey (chairman), Baltimore, Md. The Committee on Orthodontia exhibit expect to have displayed at the Jamestown Dental Convention the best and most complete collection obtainable in the country, of models and appliances illustrating the treatment of the various classes of orthodontia cases. The committee also hopes to have exhibited rare and valuable collections illustrative of the progress of the science of orthodontia from its beginning down to the present day, thus adding an historical feature to the display. The rare and valuable collection of models of the American Society of Orthodontists has already been secured, and several of the most prominent orthodontists of the country have promised to contribute. In addition to this, Dr. R. Ottolengui will read a paper before the general body on "The Purposes and Accomplishments of Modern Orthodontia," which will be a paper reviewing and comparing the best in all methods to date.

Surgical Clinic.

Dr. L. M. Cowardin (chairman), Richmond, Va. Dr. J. Y. Crawford, Nashville, Tenn. Dr. A. G. Friedrichs, New Orleans, La.

Under this head a number of important surgical operations of the mouth, face, and jaw will be performed. Among the well-known operators who have signified their intention to operate are—Drs. Truman W. Brophy, Chicago, Ill.; M. I. Schamberg, New York, N. Y.; W. J. Roe, Philadelphia, Pa.; V. P. Blair, St. Louis, Mo.; W. A. Bryan.

Nashville, Tenn.; B. G. Copeland, Birmingham, Ala.; Wm. T. Nicolson, Atlanta, Ga.; Fred B. Moorehead, Chicago, Ill.; Randolph Winslow, Baltimore, Md.

Dr. Schamberg will also give an exhibition of the X ray for making diagnosis, and a clinic showing its diagnostic value in oral surgery.

These operations will be performed in the operating rooms of the Norfolk Protestant Hospital, where patients will be cared for following the operation.

It is expected that patients will be furnished all operators, as a committee has been appointed in Norfolk and surrounding towns for this purpose.

L. M. COWARDIN, *Chairman Surgical Clinic*,
407 East Main st., Richmond, Va.

Committee on Comparative Odontology.

Dr. Wm. Bebb (chairman), Los Angeles, Cal. Dr. A. H. Thompson (sec'y), Topeka, Kansas.

In this exhibit there will be about two thousand specimens illustrating comparative odontology, together with a number of pathological specimens showing the effects of rickets, actinomycosis, etc., upon the teeth and the bones of the face. The latter are probably the most interesting feature of the collection.

There will be specimens dissected to show the attachment and the development, others displaying the skin, skull, and teeth of the various animals, together with a number of extracted teeth of mammals. The invertebrates, fishes, reptiles, and birds will be represented by their food-reducing organs. A number of human skulls will be displayed, together with a collection of pathological human teeth. The collecting, preparation, and mounting of the specimens of Dr. Wm. Bebb, all of which work has been done by the exhibitor, is a feature of the exhibit which will be of interest to many. The pathological specimens, which may possibly have some bearing upon human dental pathology, are the most interesting part of the collection to the average dental student, and in this respect the Bebb collection is unique in having a larger number of these than any other, so far as known. Those that Dr. Bebb collected himself are certainly more authentic than any which might be obtained from a

commercial collector. This collection was exhibited at the Portland Dental Congress and received the hearty praise of all those who saw it.

The U. S. Naval Dental Exhibit.

Dr. Richard Grady (chairman), Annapolis, Md.

The U. S. Naval Dental Exhibit will include many hundreds of charts of the teeth of young men from sixteen to twenty-four years of age from all parts of the country, showing at a glance, and far more impressively than printed words could ever do, teeth filled, crowned, treated, extracted, unerupted, irregular, etc.; also the size of cavity on individual surfaces of teeth; also kind of filling, or crown or bridge.

The character of the work, if gold, is designated with gold paint; if amalgam, with aluminum paint. Much valuable information is to be found in memoranda of anything of special importance, malformation and malposition of teeth and jaws, mechanical injuries to teeth and jaws, polypus of pulp, pyorrhea, erosions, stains, reflex pains, regulating appliances, painful and difficult eruption of third molars, etc. The records, showing where caries is localized, extend over a period of years, and it is hoped that some day this store of recorded dental knowledge will be tabulated, and the result of observation and study brought before the profession as scientific questions for consideration and interpretation. While the charts are simple official records of the peculiarities of the teeth and of the operations performed upon them, yet they have furnished reliable evidence in several cases of drowning, as the teeth maintained their features and peculiarities when other external signs were wanting in establishing personal identity. A summary of the relative frequency of dental caries after sixteen years of age (and before, in permanent teeth) with number of teeth present, fillings, crowns, and bridges will also be exhibited.

Committee on Dental History.

Dr. Wm. H. Trueman (chairman), Philadelphia, Pa. Dr. Chas. McManus (sec'y), Hartford, Conn.

This exhibit will show a collection of photographs, early certificates and diplomas, por-

traits of distinguished practitioners, collections of ancient dental instruments, and specimens of dental prosthetic skill, porcelain work, etc.; a photograph of title-pages of early American dental literature, books and journals, etc. The Committee on History will also prepare a report on the contribution of pioneer southern dentists, and of dental colleges and societies of the southern states. This will be published in the proceedings.

For further information address

H. W. CAMPBELL, *Sec'y*, Suffolk, Va.

Transportation Rates.

The following rates to the Exposition have been made by the transportation lines: Season tickets, 80 per cent. of double one way; sixty-day ticket, one and one-third fare plus 25 cents; ten-day ticket, one and one-third fare plus \$2.25. These rates will probably be lessened, or, if not, there are likely to be special excursions from all parts of the country and Canada at low rates.

The following places of interest can be visited as side trips: Jamestown Island, \$1.00; Yorktown, \$1.00; Williamsburg, \$1.95; Washington, \$3.50; Baltimore, \$5.00; New York (Old Dominion Steamship Co.), \$13.00 round trip; Philadelphia, by rail, \$9.00 round trip; Richmond, \$3.50 round trip.

Several watering places are within a few minutes' ride of Norfolk and the Exposition grounds.

For further information address Committee on Transportation, Jamestown Dental Convention: J. Lewis Walker, A. Allison Stores, W. M. Sturgis, Norfolk, Va.

H. WOOD CAMPBELL, *Sec'y Committee on Organization*, Suffolk, Va.

VIRGINIA STATE DENTAL ASSOCIATION.

THE Virginia State Dental Association will hold its annual meeting September 9, 1907, at the Inside Inn, Jamestown Exposition. There will be only a short session, as the activities of our members are being merged with those of the Jamestown Dental Convention. This will be strictly a business meeting; no committees will be appointed, and no work done other than certain

important matters of business, which will be designated later in a circular letter to be issued to each member.

W. H. PEARSON, *Asst. Cor. Sec'y*,
Hampton, Va.

NORTHERN IOWA DENTAL SOCIETY.

THE thirteenth annual meeting of the Northern Iowa Dental Society will be held in Sioux City, Iowa, September 4, 5, and 6, 1907.

H. P. WHITE, *Sec'y*,
Sioux City, Iowa.

THIRD, FOURTH, AND FIFTH DISTRICT (N. Y.) DENTAL SOCIETIES.

JOINT MEETING.

THERE will be a joint meeting of the Third, Fourth, and Fifth District Dental Societies of the State of New York held in Schenectady, N. Y., on October 15 and 16, 1907, at Red Men's Hall.

A. S. MOORE, *Sec'y Fourth Dist.*,
159 Jay st., Schenectady, N. Y.

ILLINOIS BOARD OF EXAMINERS.

THE annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the College of Dentistry, University of Illinois, northwest corner of Honore and Harrison sts., beginning Monday, November 4, 1907, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university, or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical depart-

ment of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee of twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license, must accompany the application.

Address all communications to

J. G. REID, *Sec'y.*
1204 Trade bldg., Chicago, Ill.

ARIZONA BOARD OF EXAMINERS.

THE Board of Dental Examiners of Arizona will meet at Phoenix, Ariz., November 11, 12, and 13, 1907, for the purpose of holding examinations. The fee—twenty-five dollars—should be in the hands of the secretary twenty days before date of the meeting.

For further information, address

J. HARVEY BLAIN, *Sec'y.*
Box 524, Prescott, Ariz.

NORTHEASTERN DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Me., at the Hotel Lafayette, October 16, 17, and 18, 1907. Preparations are being made for a valuable and instructive meeting.

EDGAR O. KINSMAN, *Sec'y.*
Cambridge, Mass.

NOTICE FROM N. D. A. COMMITTEE ON THE HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth cen-

tury. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 500, leaving 200 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUEMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. McMANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y.*, St. Louis, Mo.
CHAS. McMANUS, *Ch'man*, Hartford, Conn.

NATIONAL DENTAL ASSOCIATION.

OFFICERS FOR 1907-08.

At the eleventh annual meeting of the National Dental Association, held in Minneapolis, Minn., July 31, 1907, the following officers were elected for the ensuing year: Wm. H. Carr, New York, N. Y., president; Wilbur F. Litch, Philadelphia, Pa., vice-president for the East; J. P. Gray, Nashville, Tenn., vice-president for the South; Alfred Owre, Minneapolis, Minn., vice-president for the West; Burton Lee Thorpe, St. Louis, Mo., corresponding secretary; Chas. S. Butler, Buffalo, N. Y., recording secretary; A. S. Melendy, Knoxville, Tenn., Treasurer. Executive Committee (new members)—L. Meisburger, Buffalo, N. Y.; F. B. Kremer, Minneapolis, Minn.; M. F. Finley, Washington, D. C. Executive Council—H. J. Burkhardt, chairman, Batavia, N. Y.; J. Y. Crawford, Nashville, Tenn.; A. H. Peck, Chicago, Ill.;

F. O. Hetrick, Ottawa, Kansas; B. Holly Smith, Baltimore, Md.

The next meeting will be held in Boston, Mass., 1908.

BURTON LEE THORPE, *Cor. Sec'y.*

MAINE DENTAL SOCIETY.

OFFICERS FOR 1907-08.

At the forty-second annual meeting of the Maine Dental Society, held at Rockland July 16, 17, and 18, 1907, the following officers were elected: W. S. Miller, Fairfield, president; W. R. Bibber, Eastport, vice-president; H. A. Kelley, Portland, secretary; E. J. Roberts, Augusta, treasurer; D. W. Fellows, Portland, librarian. Executive Committee—F. H. Mead, Bangor, chairman; E. P. Blanchard, Portland; J. P. Lancaster, Madison; E. L. Hall, Augusta; I. E. Pendleton, Lewiston.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1907.

July 2.

- No. 858,827, to JOS. RAMSPERGER. Method of securing dowel pins in artificial teeth.
No. 858,828, to JOS. RAMSPERGER. Artificial tooth.
No. 858,914, to G. H. SHANNON. Dental mallet.

July 9.

- No. 859,335, to JOS. RAMSPERGER. Method of fastening pins in artificial teeth.

July 16.

- No. 860,107, to T. REMINGER. Tooth-brush.
No. 860,394, to N. LEVIN. Revolving tooth-brush.
No. 860,435, to T. H. BANGS. Tooth-brush.
No. 860,476, to J. W. HORNER. Inhaler.

- No. 860,527, to J. A. COCHRANE. Tooth-brush.

- No. 860,555, to W. C. MIDDAGH. Dental syringe attachment.

July 23.

- No. 860,840, to G. STRASSBURGER. Tooth-brush.

July 30.

- No. 861,270, to H. L. CRUTTENDEN. Pneumatic dental cement injector.
No. 861,356, to ROBERT BUCHFELD. Mouth-wedge.
No. 861,598, to I. S. MOSCOVITZ. Waxless flask.
No. 861,744, to A. L. MARSH. Electric muffle-furnace.
No. 861,874, to R. H. MACY. Dentimeter.

THE DENTAL COSMOS.

VOL. XLIX.

OCTOBER 1907.

No. 10.

ORIGINAL COMMUNICATIONS.

THE DEGENERATION OF TISSUE, WITH SPECIAL REFERENCE TO THE ORAL MUCOUS MEMBRANE.

By GEO. W. COOK, D.D.S., Chicago, Ill.,

PROFESSOR OF PATHOLOGY AND THERAPEUTICS, COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS.

(Read at the thirty-ninth annual meeting of the Pennsylvania State Dental Society,
Pittsburg, July 9, 1907.)

THE term degeneration, as used in the general sense, really means a change from the higher to the lower forms of living substance. In tissue changes it means that the structure has less functional activity than it would have if in a normal or physiological state. When there has been a chemical change in the tissues there is a true tissue degeneration, but, on the other hand, when there are deposits in the tissue cells of an abnormal quantity of the constituents of the blood, we then have a process of infiltration.

In some instances both conditions may exist in the tissue cells at the same time, as is illustrated in the case of paren-

chymatous degeneration, in which there have been qualitative as well as quantitative changes in the tissue cells. Especially is this to be seen in the parenchyma structure containing glandular tissue substance. In such cases the stroma of the tissue is peculiarly affected by deposits of certain chemical agents that normally are absent from it.

In considering all of the factors that enter into and take an active part in tissue degeneration, it is thought that heredity plays an important rôle, so far as the structural change may be concerned. But a discussion on this phase of the subject at this time would be quite out of place.

GLYCOGENIC INFILTRATION.

It is important to bear in mind, as previously stated, that infiltration and degeneration are terms that in the majority of instances are used synonymously. One of the most common forms of cellular change, with a deposit of what is apparently a substance foreign to the normal constituents of a particular kind of tissue, is that known as glycogenic infiltration, usually spoken of as infiltration and degeneration. This tissue change can and does many times take place in almost every tissue of the body. It is called glycogenic infiltration because the glycogen is deposited by the circulating fluids of the tissue structure itself.

It will be borne in mind that glycogen is a carbohydrate-like substance which is almost constantly present in small quantities in the tissues of the body in a normal state; especially is this substance found in the muscular tissue and in nerve and epithelial structures. As it appears in the muscular fibers it seems to be changed many times to a certain form of lactic acid. If the chemical molecule of glycogen be studied, it is easy to see how it is possible for such a chemical reaction to take place. The chemical formula of this substance is $C_6H_{10}O_5$. Thus it will be seen how this compound can be reduced to one of the isomers—lactic acid, paralactic acid, and sarcolactic acid. The compound of glycogen, with its many derivatives, can without a doubt be present in abnormal quantities in the mucous cells of the oral mucous membrane, and sometimes in the submucous structure of that tissue.

By investigation it has been shown that after treating the oral epithelial cells for from three to six months, glycogenic infiltration usually follows. This is most easily seen as a result of the use of some irritating chemical agent followed by the active use of a stiff toothbrush, thus bringing the border of the gum extending around the necks of the teeth into direct contact with the irritating force that is so frequently used

in brushing the teeth. After the application of a solution capable of irritating the gum tissue, or after bringing some mechanical force into direct contact with the tissue—the length of time above mentioned having elapsed—this glycogenic substance can be identified by properly cleansing the tissue, removing a portion of it, and placing it in a solution made up of four parts of absolute alcohol and one part of tincture of iodine. If the glycogen present in the epithelial cells should be of sufficient quantity to be thrown off with the mucus excreted, it can be observed in this mucus by adding to the latter the above mixture. After the combination stands for a few minutes it will take on a brownish red color. The same alcohol-iodine reagent added to the tissue cells and viewed under the microscope will appear of a portwine color.

In this connection it might be well to state that any substance that in any way influences the carbohydrates of the body also influences glycogenic activity in any, or all, of the tissue cells, and especially certain cellular structures containing secretory cells. After the establishment for a few days of this degenerative activity of the cells, it is sometimes an easy matter, by the use of some oxidizing agent, to convert the glycogen into certain acid derivatives; and these acid derivatives can be further broken up by certain enzymotic action of the tissue cells or by certain bacteria that may come in direct contact with this substance.

There is another important point in connection with this degenerative process: It not only renders the tissues capable of a diverted activity, whereby certain acid derivatives can be acted upon by the tissues, but it leaves a field that is peculiarly predisposed to the action of pathogenic bacteria. The action of bacteria on the glycogen as it comes from the mucous membrane is not understood; but the possibilities of this action as a precursor of certain acid derivatives are of sufficient importance to render the subject worthy of a more extended investigation; especially would research be valuable with reference to the glycogen

as found in the oral mucous membrane. The pathologic changes that take place in the tissue cells, and especially in that part concerned with the formation of glycogen, may be enhanced by the bacteria producing an acid change. This resultant acid acts upon the enamel of the tooth, and brings about certain forms of erosion.

It is important to call attention to the fact that infiltration of tissue with abnormal quantities of a normal constituent of the body is more likely to take place in the lymphoid and mucous cells of the body than in any other tissue structure.

HYALIN INFILTRATION.

Hyalin infiltration is another form of degeneration that is found in certain glandular structures and tissues; but it is not so common as the one just mentioned. Hyalin degeneration, when present in the tissues of the oral mucous membrane, can usually be identified by means of an acid stain. This substance is sometimes deposited in the intercellular substance and sometimes in the stroma of the tissue, but more often in the former than in the latter. An interesting case demonstrating this particular feature was observed, in which there was a thickening of the gum tissue extending around the bicuspid and molars. On the removal of a portion of this gum tissue, and treating it for microscopic purposes in the usual way and staining it with an acid fuchsin and picric acid, it showed signs of hyalin infiltration to such a marked degree that it could not be mistaken. Epithelial cells scraped from diseased gum tissue, as just mentioned, revealed in many instances the same appearance as is given by the usual well-defined hyalin degenerated tissue. But this method, together with the evidence revealed in the loose epithelial structure of the mucous membrane, does not give such sufficient and positive proof of the presence of hyalin in the upper layer of the mucous surface as would warrant our stating its presence there to be at all constant.

MUCOID DEGENERATION.

The next form of degenerated epithelial structure of the oral mucous membrane—and one upon which I place considerable stress, as being the most pronounced type of tissue degeneration in the mouth—is that of mucoid degeneration. This is a condition manifesting itself principally in the epithelial cells of mucoid structure. Of course it will be borne in mind that such a condition might be present in any organ or tissue containing mucous glands. The first appearance of this degenerated process is usually observed in the form of goblet cells. These cells show the presence of vacuoles, and have a granular appearance. These vacuoles appear most commonly in the cytoplasm of the cell. After they have extended until a number break down into a large clear space of the cytoplasm, the nucleus disintegrates and becomes granulated. These granules will in the majority of instances take a basic stain. Many times these degenerated cell tissues show almost a form of coagulation necrosis, but the process is such a slow one that the retrogressive changes of the nucleus do not show very markedly until the latter completely disintegrates and takes on a large granular appearance.

During the degenerative processes these large mucoid structures show a decided difference both in their shape and in their capability of taking stains, from those of an inflammatory condition. There we have also degeneration of these cells, but we discover it through an acid rather than through a basic stain. In the form of degeneration of epithelial structure that can so frequently be found around the necks of teeth and in the interproximal spaces, the mucus of the cells becomes stringy and very tenacious. The quantity may not be so very much increased, but its chemical and physical structures are considerably changed. In the chemical manipulation of the mucous exudates there are usually two distinct substances to be extracted, one being the pseudo-mucin and the other paramucin. When this degenerative process takes

place in any tissue there is almost always present chondroitin, the chemical formula of which is as follows: $C_{18}H_{27}NSO_{17} + H_2O = H_2SO_4 + C_{18}H_{27}NO_{14}$. In looking over this chemical reaction it will be observed that when this substance (chondroitin) is present in the degenerated mucus it might give rise to a decided acid reaction.

There is another chemical compound sometimes present in the mucus that has many of the general characteristics of the substance just mentioned, and that is chondrosin. It is but slightly soluble in water, but when found in the saliva it is there as a monobasic acid, and should the mucus be alkaline it will reduce copper oxids practically in the same way as will dextrose. According to Schmeiderberg the atomic grouping of this compound is the same as in glucuronic acid. If it were present there in the form that was suggested by this author it would yield furfural, which can easily be oxidized into mucic acid. It was found in the saliva in two cases in which glucuronic acid was present, as shown by the orcin test. There was considerable degeneration of the epithelial cells in both of these mouths, and erosion had extended to a frightful extent on the six anterior teeth. All sorts of mouth-washes had been used, of course with the usual persistent brushing. In these cases there was a distinctive mucous degeneration of the epithelial cells of the mucous membrane overlying the teeth affected by the erosion. Even the submucous structure had undergone degeneration. It was also observed that in those cases where strong astringents were used on the mucous membrane, the mucous follicles usually became so contracted that they would hold the mucin in the cell for a sufficient amount of time to cause a chemical change in the mucin itself. This phase of the subject, to my mind, is of vast importance to those prescribing astringent antiseptic solutions for various forms of changes in the mucous epithelial cells.

We have previously mentioned one of the most important phases of oral pathology—the inherited tendencies that

appear in the mucous membrane of different individuals. We know that some astringent agents might be used in some mouths for years without any deleterious effects resulting therefrom, while in other mouths they would show pathologic changes in a few months. I have elsewhere shown that many of these mouth-washes arrest the action of the digestive ferments of the body. I believe that a good test for a mouth-wash, if one is to be prescribed at all, is to find out whether it retards the action of these ferments on their respective foodstuffs, because it is my firm opinion that an agent that will stop the action of ptyalin on starch will bring about some cellular changes in the epithelial structure that will be more or less detrimental to its true physiological function.

COLLOID DEGENERATION.

In the discussion of this phase of cellular degeneration I have only touched upon some of the fundamental processes that take place in tissue degeneration, and I am not sure as to just how I can differentiate between colloid tissue degeneration and mucoid tissue degeneration. This phase of pathology has been an interesting field for investigation to many authors, not only in connection with the mucous membrane of the mouth, but with other tissues as well. Mucin and colloids are by no means easily separated from each other. In colloid as well as in mucoid substances we have proteid-like bodies that are difficult to differentiate from each other. In colloid degeneration there is more of a glue-like structure that remains in the tissue cells for a much longer time than in the case of mucoid degeneration. In the mucoid degeneration the substance is thrown out in accordance with certain phenomena peculiar to the structure, while the colloids will remain for an indefinite period bound up in the cells, and the degeneration may progress slowly, with a decided change in the nucleinic substance of the cells. The physical difference in the composition of the two is that mucus swells up when placed in water, while the col-

loids are but little changed. The colloids act more like the pseudo-mucins, and assume a characteristic very much like gelatin.

Mucin is precipitated by alcohol and acetic acid, while colloids are not affected by either of these agents. Colloids act in many respects identically as albumin. They can exist as an acid or alkali, forming a salt that is capable of dissociation. They will exist as an acid or alkali in a gelatinous mass. During the existence of the gelatinous condition it is possible for them to change backward and forward, forming first an acid and then an alkali, and again an acid, and so on for a considerable time. Hardy and many other investigators have shown how it is possible for these cells to take up a certain amount of inorganic salts and hold them in combination for a certain period, and then throw them out again into the saliva or any of the mucoid substances. The so-called gelatinous plaques—first mentioned by Black—according to my observations are a colloid-like substance. They can gather bacteria into their folds and so these become attached to the teeth and there remain, while they are subjected by osmosis to all the influence of the various constituents of the saliva. Here they draw their foodstuff and here produce all the physiological changes that bacterial life is competent to perform in these gelatinous sacs, without being disturbed by the surrounding conditions.

I have been able in a few instances to precipitate colloidal substances from the saliva. I have then placed extracted teeth in the solution, to find that in a short time the substances would become attached to the surface of the teeth in such a way that it was almost impossible to remove them. These colloidal substances really have a special affinity for tooth-structure. I have also suspended bacteria in these colloidal sacs and tried to act upon them with various antiseptic agents, but up to the present time I have failed with all except potassium iodid. This agent seems to be able to

permeate colloidal walls and to destroy bacteria that are inhabiting them.

CLOSING OBSERVATIONS.

Degeneration of tissue in the oral mucous membrane is a pathologic process that has a fundamental bearing on all the changes that take place in the oral cavity. This process can be established by physical and chemical means. There are no agents, according to my present understanding, that have a more deleterious influence on the mucous membrane than those agents that cause astringency of the mucous follicles or those that produce over-stimulation of the cells in the vicinity of the mucous membrane surrounding the necks of teeth.

A solvent for colloidal or mucous substance in the oral cavity is another phase of the subject that will require investigation and study. Benzoic, salicylic, or boric acid, when used in mouth-washes, should be incorporated in some form of alcohol; otherwise the tissues, when subjected to their use for a considerable length of time, will become the seat of certain pathologic lesions that will act upon the tooth-structure and on the normal mucous cells in the vicinity. In the presence of mucoid degeneration of the epithelial structure it is positively sure that destructive changes of tooth-substance will ensue.

The observations upon which this paper is based are principally from two sources, namely, clinical and experimental. There are many facts that I have observed which I have not recorded in this paper because of the length of time it would require to go over them all. Suffice it to say in this connection that the possibilities of solving some of the difficult problems of dentistry through this field of investigation are far greater than any of which my hopes at the commencement of this work would permit me to dream.

I am specially indebted for their assistance in this work to Drs. Mathews and McGuigan.

THE VALUE OF ASSOCIATION.

By A. H. PECK, M.D., D.D.S., Chicago, Ill.

(Read before the Dental Society of the State of New York, at its annual meeting, at Albany, May 10, 1907.)

LONG ago a wise man declared that "As iron sharpeneth iron, so a man sharpeneth the countenance of his friend." Somehow the ancient writer happened upon a great truth—a truth affirmed by every finding of psychology and by the testimony of experience. Man was not made to live in isolation. Indeed, we need not limit our investigation to man, for the lower orders of animals betray the same tendency toward community life. You may indeed find a solitary deer roaming the woods, or a lonely bird winging its way through the upper air; but these are the exceptions that prove the rule, and their solitary hours are but slight breaks in their habits of companionship. Even the modest violets love not solitude, but form their little communities of beauty. The detached and unrelated man is the abnormal and atrophied man. The human soul does not thrive apart from other souls.

On the 20th of May, 1828, a strange lad appeared upon the streets of Nuremberg. He was some sixteen years of age apparently, but was a child in understanding. He had but little command of language, but carried a letter purporting to have been written by a peasant to whose care he had been committed when a baby, and this letter stated that the child had been kept in confinement, segregated from other members of the human family. Aside from the speculations awakened as to the boy's parentage and the reasons for this strange treatment, he awakened the keenest interest in the students of psychology. Here was a mind that had been deprived of contact with other minds. He was distinctly abnormal. He was as unlike the average

boy of his age as the sickly potato vine that has grown in some dark corner of the cellar is unlike its vigorous relative that has flourished under the open sky. His mental powers were still germinal. He had never found himself.

Take, if you will, the case of Helen Keller. Here is a personality that was shut off from relation with other personalities. The ears were closed to all sounds and the eyes were sightless. These great avenues to the soul being barred, she lived alone. But the day came when a highway was made to the centers of intelligence, and the ideas and emotions of other intelligences came into her possession. Then her soul awakened and pushed out its walls. A thousand streams of influence, heretofore unknown to her, began to flow into her life. Today she is one of the most gifted women of her time.

These are but illustrations of the truth that I am seeking to emphasize—viz, that we are interdependent; and this interdependence is radical—it includes not only the comforts of life, but life itself. There are potential forces in the human soul that can never be realized, never be set free and started on their way toward full development, except by attrition with other souls. Emerson says, in one of his essays, "Our chief want in life is somebody who shall make us do what we can." It is not by lonely contemplation and introspection that we discover latent powers, but by the trial of our strength to which we are urged on by the example and influence of those about us. The baby bird peers over the side of the nest and fears to try its wings; but the parents flutter about it with their cries

of encouragement, passing sometimes to a vigorous push, until the fearful youngster launches itself into the air and finds its powers of flight. We can never explore our own capacities alone. We cannot know our strength, we cannot measure our weakness, until we have tried ourselves among the multitudes upon the boundless plains of life. Manhood is more than existence. It is growth and accomplishment along useful lines. We are made to advance, not to vegetate. Shakespeare said, "What is man, if his chief good, and market of his time, be but to sleep and feed?" If we are to be men, strong, full-grown, competent, and helpful, we must find our powers and come to our kingdom by contact with others of our kind. The constant interplay among the forces of nature typifies that which must be in human life. The cloud gives to the earth, the earth to the streams and oceans, and these in turn give back to the clouds again. So, evermore there is going on an endless round of giving and receiving. No less closely tied together are the forces of the soul. To receive and to impart—in these unvarying processes does man come to his manhood and fulfil his destiny in the universe.

LIKE TENDS TO LIKE.

But let us pass from the general to the particular. We have special interests, and special tasks to perform. Here again we may learn from sub-human life. Like tends to like. When the bobolink feels the touch of autumn in the air and begins its preparations for a journey to the Southland, it does not join itself to a flock of blackbirds, but to others of its kind. Companionship there must and will be; but it is controlled by laws of congeniality if not of consanguinity. Men are brought into one vast family by ties of brotherhood; but in this family they group themselves according to special interests. It will not do to say of any two men in all this world that they have nothing in common, no matter how unlike they may be. The cultured Caucasian, and the barbaric Afri-

can in his native forest, have that in common which is fundamental and real, and that sets them apart from the lower animal life. They will stand side by side in mutual defense against the attack of the tiger or the onrush of the enraged elephant. But it is permissible to look beyond man as man, to man in his special undertakings; to consider the classifications that spring from interests mutually shared. The savage cannot enter into the feelings of the botanist as he pushes his eager and unresting search for rare forms of plant life. The botanist is incapable of sharing in the zeal of the philologist, who devotes all his days to the study of languages, dead and living. The philologist imperfectly understands the enthusiasm of the entomologist who goes chasing over the fields and peering into decaying trees in search of bugs and beetles. As in an army there are sutlers and engineers and foot-soldiers and cavalymen and artillerymen, each with their special departments of activity, and all bound together in one great whole, so in life we have our subordinate aims that serve to catalog us, our specific aims that call together those who share these purposes.

So it comes to pass that in our present-day life we find groupings of people with definite and particular interests. Labor organizations find their explanation here. The Grand Army of the Republic owes its existence to this law of aggregation according to common interests. Preachers, teachers, physicians, engineers, editors, farmers, reformers, politicians, scientists, peace advocates, temperance workers, and a host of other bodies organized about some special interest, mark the life of our time. It is sometimes said that we are organized to death; that progress is impeded rather than helped by the numberless wheels and wheels within wheels of present-day society. It must be admitted that it is quite possible to overdo even a creation of new and endless organizations. It is charged that when the Englishman has a few unfilled moments he cries, "Let's go out and kill something." I am not sure but that, with equal truth, we might now say that the

average American employs his leisure time by going out to organize something.

There is a fundamental and dangerous fallacy at the base of some organizations, namely, that organization is an end in itself. It seems to be assumed that it is worth while to make a machine whether it be calculated to serve any useful purpose or not. Now it is a well-known principle in physics that increase of machinery means decrease of efficiency whenever the increase exceeds real utility. Nothing is gained by having a society simply for the sake of having one. Another fallacy that needs to be exposed and annihilated is that having created a machine it may be trusted to run itself. Some years ago a volunteer fire company in a country town bought a used engine. The boys rubbed and polished and oiled it, until its parts worked smoothly and its shining surface might have served as a looking-glass. Then the infatuated men wrote this placard and hung it over their pet: "She runs herself, she do." But on a stormy night when the mud was deep in the streets, the fire bell rang out its alarm, and then the credulous men found out their mistake. As they tugged and strained at the ropes with which they dragged the engine through the mud and up the hill, they came to a profound and saddening realization that "She didn't run herself, she didn't." No machine has ever been invented that will generate its own power. No organization was ever perfected that will go of itself. Efficient and worthy organization must have in it, as constant motor, man's will and man's work. When we have created the organization we have simply supplied ourselves with an agent through which the purposes and powers of men may find their expression.

THE APPLICATION TO OUR PROFESSIONAL LIFE.

That which has thus far been said is preliminary; and yet it has specific reference to that which remains to be said. We are members of a distinct profession. We have our definite and special functions in the life of the community, as

well as our general duties as men and citizens. We have qualified ourselves to serve the interests of our fellow men in a particular way; to gain our livelihood by devotion to certain well-defined tasks. Whatever may have been true fifty or seventy-five years ago, the dentist's work now fills a place of recognized importance. To return to the old-time conditions when the only relief from an aching tooth was found in getting it out as soon as possible, when the average man paid less attention to the inside of his mouth than he did to the outside of his horse, would be a distinct reversion to a state of semi-barbarism. It is not a part of our present task to recount the steps by which our profession has come to the place of honor and importance that it holds in modern life. It is enough to point to the great progress made, and to suggest that which we all realize—the imperative duty of keeping pace with the unfolding life of our time. While we have every reason to felicitate ourselves on the position now occupied by our profession, and upon the valuable contributions that we are making to the public welfare, it would be suicidal to assume that we have reached the heights and that nothing remains to be done. Rather should we look upon past accomplishment as only a prophecy of that which the future is to see. Rather should the triumphs thus far achieved spur us to new exertion that we may win still more glorious victories. We are not to live with our faces turned toward yesterday with its defects and impotence, nor with hearts contented with today and its achievements; but with our vision filled with tomorrow and that which we may bring to it of accomplishment:

Tomorrow and tomorrow are as lamps
Set in our path to light us to the edge
Through rough and smooth.

And if we are to go forward, if the past success is but to furnish standing-place for new and finer achievement, what are the conditions under which the advancement may most certainly and most largely be secured? Not by taking as our motto "Every man for him-

self," but by filling our hearts with the nobler sentiment "Each for all, and all for each." In other words, we must put ourselves in accord with the nature of things; we must touch elbows in our march; we must give to and receive from each other. Nothing large in the advancement of our profession can be realized save through conference and interrelations. And now we come—though the way may seem devious to some of you—to the crux of the whole matter now under consideration, viz, the importance of associational life and endeavor to our profession. We have already seen what this means in the wider range of human interests, and how uniformly the law of classification and co-operation according to interests prevails in the world about us. We are no exception to the general rule; that which works for the benefit of other classes will surely minister to the well-being of the one class represented here today. We have our national, state, district, and city associations. That for which I plead is that these organizations be given the loyal support and the unselfish devotion which shall serve to make them vital, and shall turn their potential usefulness into glorious realities.

To turn from the somewhat theoretical to the practical: What advantage is there in association? Do our organizations perform any useful function? Perhaps it would be better to ask, Are they calculated to perform any useful function? To this there can be but one answer from the thoughtful men of our profession, and the reasons for this answer are not far to seek. It is only by united action that protection can be secured for the legitimate practitioner, and the legal safeguards be thrown about our profession that are essential to its highest and truest success. Acting alone we are impotent before the unremitting activity of charlatans and ignorant pretenders. Acting together we can relegate the quack to the limbo where he belongs. There are many ways by which the interests of our profession have been advanced during the last quarter of a century, and we shall discover, upon investigation, that in al-

most every instance the inception of a forward movement is to be traced to some association. The discovery, the invention, the new and better method, may be and often has been wrought out by the individual; but the inspiration, the impulse, has been born of contact with his fellow workers. I do not hesitate to affirm that the mental alertness which makes progress possible is begotten almost entirely by the contact of mind with mind. Shut the man up by himself, segregate him from his fellow practitioners, and his mental powers tend to inactivity and decay. It is another illustration of the proverb with which this paper opened. Mind sharpens mind. In the attrition of association we are stimulated to ideas and ideals that would never have been born in solitude.

But it is claimed by some that all the best results of professional discovery and progress are put into printed form, and may be read in the office or the home. True, most of that which is wrought out of thoughtfulness and toil by the workers and the thinkers in our profession, is set forth in descriptive forms for the benefit of all. But is any man satisfied with this? Will anyone claim that descriptive instruction equals in value visual instruction? Are you as well satisfied with reading of the wonders of the Yosemite Valley or of the Canyon of the Colorado as with looking upon them with your own eyes? It is much to read of things; it is more to see them. We venture to assert that the foremost men in every profession, our own not excepted, are those who take every opportunity to learn by contact and by personal investigation, as well as through the columns of technical books and periodicals.

But the question goes deeper than this. In the last analysis we are confronted with this interrogation: Are associations of dentists essential to the highest interests of our profession? If I do not utterly mistake the temper and convictions of my fellow practitioners, the answer to this will be a mighty volume of affirmation. Now if this be true, if the association performs an invaluable function, as we believe, how are its

interests to be subserved? This cannot be done by oral approval simply; it must have the approval of devotion. It is not enough to wish it well; it must be supported well. Someone must attend its sessions, bear the burdens, do the work. The association that is not attended is as valueless as the historic gun that had neither lock, stock, nor barrel. Somewhere we have come across this doggerel:

What sort of a church
Would my church be,
If all the members
Were just like me?

If it be permissible to substitute the word "association" for "church," I would like

to have this quotation placed before every man here today:

What sort of an association
Would our association be,
If all the members
Were just like me?

Fellow workers, the price for high accomplishment has ever been, must ever be, unselfish devotion. Advancement, personal or general, does not come by chance. If dentistry is to maintain the high place to which it has attained, if it is to go forward to larger victories, into the progress must enter your service and mine; not only as we stand alone in the particular place where our office-work may lie, but much more as we stand shoulder to shoulder in associated effort.

GOLD INLAYS IN COMPOUND CAVITIES OF MOLARS, INVOLVING THE MESIO-OCCLUDING AND DISTO-OCCLUDING SURFACES.

By T. C. TRIGGER, L.D.S., D.D.S., St. Thomas, Ontario, Can.

(Clinic given at the Canadian Dental Association, Montreal, September 6, 1906.)

IN order to present the subject of gold inlays at this meeting I have prepared specimens showing the various cavities in which inlays may be successfully used in the anterior and posterior teeth, the preparation of the cavities and cavity edges, the methods used for the retention of the inlays, and the manipulation of instruments in the construction of the matrices. But in my descriptions I shall confine my clinic to approximo-occlusal cavities in molars.

The value of the gold inlay process of filling cavities in molars as a means of preserving tooth-structure cannot be overestimated. The permanent results obtained by this method are excelled by those of no other, for the attempt at restoring large compound cavities in these teeth by means of cohesive gold or its

combinations, where a large area of enamel has been destroyed, thus exposing a large surface of dentin—often likewise badly broken down—many times results in failure, owing to the difficulty of adapting the filling material in the inaccessible portions of the cavity, thus favoring the ingress of moisture and the ultimate recurrence of decay.

By inlaying these cavities with gold, the use of the rubber dam, a very objectionable though indispensable operative accessory in the construction of cohesive gold fillings, may be dispensed with. In large cavities of this class the use of clamp matrix attachments is also unnecessary, an additional argument in favor of the inlay, for they are not only difficult appliances to insert, but, in addition, are the source of considerable

anxiety to the operator on account of the uncertainty of their remaining in one position throughout the operation. Owing to the anatomical characteristics of the molars, they allow a greater range for the retention of inlays than do any other teeth, on account of the greater strength of their enamel walls, and also because they admit of greater extensions being made on the enamel surface, as well as in the cavity. The restoration of these large compound cavities in the molars by means of the inlaying process of filling diminishes to a considerable extent the severe physical strain on patient and operator induced by the insertion of large fillings of cohesive gold foil.

CAVITY PREPARATION.

The preparation of the cavity in these teeth in which a considerable loss of the approximo-occluding surface has occurred is very much the same as that of cavities of similar character in the bicuspids. It should be prepared in the usual way, as if for the insertion of a cohesive gold filling, except that no undercuts should be allowed, so that easy access may be had for the operation of forming the matrix and the final insertion of the inlay. Cut the enamel walls freely bucco-lingually, so as to give easy access to the cavity, a very essential point for the construction of the matrix when using either the direct or indirect methods. For this reason it is not necessary to obtain a separation by wedging, as such cavities in these teeth admit of a greater extension in the preparation of the cavity than any other teeth that may be inlaid.

All frail enamel walls should be removed. Usually it is necessary to sacrifice more sound tooth-structure in the preparation of these cavities for inlays than is necessary for a gold filling. The enamel walls must be at any rate strong enough to resist the pressure in swaging and adapting the matrix. The marginal edges should be cut straight, and beveling should also be avoided. The enamel walls should not terminate too abruptly in short curvatures, for it is impossible

to force the matrix into such acute positions, or otherwise sharp angles on the enamel edge would tear the matrix during the swaging process.

The basal wall should be cut in a rounded form as shown at Fig. 1, but if the enamel walls have been extended labio-lingually to a considerable extent, they should be cut flat. Cut the buccolingual walls perpendicular, or nearly so, in order that the borders of the cavity may converge slightly toward the basal

FIG. 1.



surface. The morsal surface of the cavity is prepared according to the degree of retention required, for in deep cavities the side walls would afford considerable lateral support to the inlay. The depth of the cavity will also increase the cleavage surface of the cement in the cavity and at the extension attachments made in the inlay for purposes of retention. In this event the occlusal surface should be cut in a crescent shape, as shown in Fig. 1.

Where the cavity has not such good retentive form as in the above-mentioned case, and where greater retention is desirable, a dovetail extension can be made in the occlusal surface, which will lock the inlay to the enamel walls and prevent its dislodgment before it is permanently cemented in position. This extension in the enamel surface should be made in the direction of the central fossa, at which point the tooth tissue is, as a rule, defective. It is advisable to limit this means of retention to one extension, as by the use of two or more the swaging of the matrix will be complicated, and demand a more elaborate preparation of the cavity edges. The orifice of the dove-

tail extension should be wide enough to accommodate a flat-end burnisher, in order that it may be forced easily against the enamel walls at all points without leaving an intervening space, and also without tearing the matrix. To make

FIG. 2.



this extension (Fig. 2) a round fissure bur may be used. All the cavity margins are finished with fine finishing burs and small stones, and are finally polished with sand-paper disks. Fig. 2 shows the outline of the cavity margins. In no case should the bucco-lingual cavity edge come in contact with the approximal surface of the opposing tooth, as it will prevent an easy adaptation of the matrix and also interfere with the finishing process.

The shape of the prepared cavity will depend on the method of retention used, for while in some cases the matrix may be forced so as to lie in close apposition to the floor and cavity walls, in other instances an intervening strata of cement may act as a core and prevent the matrix from being forced against all cavity walls. In the latter case pins, posts, or loops may be attached to the inlay.

THE MATRIX.

There are two metals used in the preparation of the matrix, namely, gold and platinum; the former is used almost exclusively in the construction of gold inlays. As gold is more ductile and less rigid than platinum, it can be forced and adapted with greater accuracy to the cavity walls. In cavities of this class the thickness of the metal used for matrices is considerably greater than that of the matrices used for cavities of lesser depth, for in deep cavities, the metal being

stretched considerably, ample thickness becomes an important requirement.

After obtaining a piece of gold of proper thickness, it should be annealed by heating the foil to a cherry-red appearance, after which it is immediately plunged in a solution of four parts of sulfuric acid to one of water. Gold thus treated is not only softened, but also cleansed. Good results are also obtained by immersing the metal in alcohol. If platinum be used for matrices the swaging quality of the metal may be improved by gradually heating it in an electric furnace until it becomes white, afterward gradually reducing the temperature. The size of the foil used for forming the matrix must be cut considerably larger than the extent of the cavity surface, in order that it should overlap the marginal edges. The oblong is a convenient form in which to cut the foil, that part which is applied to the gingival portion being cut round, in order that it may readily pass beneath the gum.

As has been stated, the direct and indirect impression methods may be used to form the matrix, but the method usually adopted is the former, as it is the more rapid way of swaging the matrix, requiring neither the labor of taking an impression nor the construction of a cast upon which to swage the matrix. The indirect means of forming the matrix may be used to advantage in complicated cases, and more especially in deep cavities where the matrix is forced to absolute apposition to the cavity walls, in order to thus obtain greater retention.

The technique of the construction of the matrix by the direct method is as follows: After the matrix foil has been cut to the required shape, it is carried well under the gum, and swaged approximately in the cavity with a rubber-end matrix swager; the foil is then forced deeper into the cavity by means of suitable matrix burnishers—pellets of cotton batting, spunk, or chamois. It is then carefully removed from the cavity and trimmed so as to leave an overlap of about two lines beyond the cavity margins.

Before the matrix is finally returned to

the cavity, it should be re-annealed, so that the gold will readily adapt itself to the cavity walls. In using matrix instruments to force the foil in apposition to the cavity walls and cavity edges, slight direct pressure should be applied, as a burnishing force will cause the gold to become rigid, and will render more difficult the forcing of the matrix to its proper position. Pellets of cotton, rubber forms, spunk, etc., are used in conjunction with the burnishers for adapting the matrix. Care should be exercised in forcing the gold well against the marginal edges, as this is the most important point in the operation of matrix formation. The closer the contact of the matrix with the cavity edges the more perfect will be the finished inlay. If tears should occur in the cavity part of the matrix they can be easily repaired before the casting process by forcing a small piece of cohesive gold in the openings; but if a tear is found on the marginal edge, the matrix should be discarded and a new one formed, for there is no way to mend such tears successfully. To accomplish successfully the burnishing of the matrix to the cavity

FIG. 3.



Matrix burnisher.

edges, a double-ball instrument (Fig. 3) should be used so that it may be placed astride upon the marginal edge, and on the gingival border the use of a flattened burnisher will produce the desired results.

To remove the matrix from the cavity

it should be gently teased therefrom with a fine-pointed instrument, so as not to affect the shape, and then allowed to drop on the mouth-mirror which may be used to convey the matrix to the laboratory. In these cavities the methods used for the retention of the inlay will depend upon the means used in the construction of the shell inlay and the countersunk inlay with pin attachments.

In the construction of the shell inlay (Fig. 4) a core of cement is formed at the base of the cavity and built up to within a few lines of the marginal edge. The intervening cement will prevent the matrix from being forced to the floor

FIG. 4.



FIG. 5.



of the cavity, and while rendering easier the forming of the matrix, will allow for the attachment of pins, posts, or loops. The method for making these attachments is as follows: In devitalized teeth, where it is possible to make an extensive retention for the inlay, a small tube may be placed in an upright position (Fig. 5), and the core of cement formed around it on a level with the upper extremity of the tube. The matrix is placed over the core, and a post is inserted through the foil into the tube, extending it slightly beyond the matrix. The matrix and post attachment are withdrawn from the cavity by means of wax inserted on a cavity impression tray. Matrix and post are now invested in plaster, and after the mass becomes thoroughly set the wax is removed by means of hot water, after which the matrix is ready for the contouring and casting process. The post attachment will readily pass into the tube in the core. Most of the core should be removed from the cavity in order to afford a stronger retention for the inlay when permanently cemented to place.

The post and tube attachments provide a stronger retention than any other means used in the construction of the shell inlay. To make the pin attachments to the shell inlay, after withdrawing the matrix from the cavity, it is inserted on a stick of impression wax. The Perfection wax made by the Detroit Dental Mfg. Co. can be had in stick form—which I have suggested—of convenient size upon which to force the matrix while the pin and loop attachments are being made. Insert the matrix on the end of the stick of wax by means of dry heat to soften it, and force the matrix very carefully on it so that it may not become distorted. The wax should extend to the

the wax. The countersinking is made through the matrix and into the wax beyond, according to the depth of the retention required, by using a good sized round bur and cutting slightly beneath the edge of the orifice. The countersink should not be cut so as to interfere with the cavity edge of the matrix. The retention of the inlay is increased by the insertion of a pin in the countersunk depression thus made, although one or more pins may be attached, according to the size of the orifice. The pin should be heated and forced slightly into the wax, and also extended beyond the orifice thus formed as far as the extent of the cavity will allow.

In an extra-large cavity it may be an advantage to use two retentions in this manner, one in the body of the inlay and the other in the dovetail or doll-head extension. Another way of making the countersunk extension is by investing the matrix directly in the plaster batter, and after it becomes sufficiently set the countersink is made through an opening in the concave part of the matrix, and is also extended slightly beyond the latter. The pin is placed in an upright position, with the head downward, and the core, which will form a countersink, is built up around the pin to a size which must vary in proportion to the depth of the cavity, in order that it might not interfere with the casting process (Fig. 8). In choosing a method of retention for the inlay, the operator will be guided by the area and depth of the cavity and the amount of occlusal stress to be overcome. As stated above, the matrix for these cavities can be formed by the indirect method to advantage in complicated cavities where considerable swaging of the matrix is required, and where the operator has the necessary time at his disposal in order to carry out all the requirements of construction, the matrix will be as satisfactory as if prepared by the direct method.

Before commencing the operation of forming the matrix by the indirect method, it is absolutely necessary to fill in all undercuts, so that an accurate impression of the cavity can be had. To

FIG. 6.



FIG. 7.



FIG. 8.



marginal edges of the matrix, and after it has become thoroughly hard the matrix is ready for the pin attachments. To insert the pins in the matrix (Fig. 6) holes are drilled through the latter and slightly beyond into the wax. The pins should have well-formed heads and be of such length as the depth of the cavity will allow. They are forced slightly beyond the matrix, so that the solder may have a hold on them in the casting process. Gold or platinum loops may be substituted for the pins.

The method of countersinking with pin attachments (Fig. 7) is used in these cavities more particularly when there is no core formation and the matrix extends to a considerable depth in the cavity to allow for an extension in the inlay for purposes of retention.

Withdraw the matrix from the cavity in the usual way and insert it in

obtain such an impression it is necessary to employ a good wax that will take a keen outline of the whole cavity and cavity edges. For this purpose excellent results are obtained with Perfection wax or dental lac. It is likewise necessary

FIG. 9.



to have a tray upon which to convey the wax to the cavity, of such form as will admit of its being withdrawn without affecting the form of the impression (Fig. 9). When the impression is removed from the cavity care should be taken to see that an accurate outline of the marginal edges has been obtained, and if it be found satisfactory the cast may then be prepared.

THE CAST OF THE CAVITY.

Low-fusing metal, amalgam, or cement may be used for making the cast. I prefer amalgam, as a definite outline can be had with it, and also because it possesses considerable edge strength to withstand the swaging process. On account of not possessing sufficient edge strength, cement cannot be used in every instance. In making the cast a small surface of the tooth beyond the marginal edge of the cavity should be included, in order that the matrix may be swaged a few lines beyond the outline of the cavity margins. Thoroughly incorporate the amalgam into the impres-

sion, and after it becomes set remove the wax.

To form the cast the impression may be directly invested in plaster, and on the removal of the wax the cast may be made of amalgam. The matrix foil should of course be considerably larger than the cavity, so as to allow for the metal being drawn into the cavity in the swaging process. After adapting the matrix to the deeper portions of the cavity by means of burnishers, swage it into the cast of the cavity. After the swaging has been completed, the matrix is removed and trimmed to within two lines beyond the margin of the cavity edge. Again anneal it and re-swage it. If tears occur other than at the cavity edges, they can be subsequently mended with pellets of cohesive gold. The matrix is then removed from the cast, is inserted on a stick of wax softened in the usual manner, the necessary attachments are made on the matrix, the whole invested in plaster, and the contouring and casting completed. To form the contour a thin piece of gold is applied to the exposed surface of the cavity, fitting it closely against the marginal edges. This piece of metal is held in place by means of a little wax, while the surface is protected and held in place with a small amount of the investment material. The wax is removed and the cavity to be cast is filled with small pieces of 18, 20, or 22-karat solder. To heat the investment easily, place it on a piece of charcoal, and by means of the mouth blowpipe cast the inlay.

Melt the solder until it assumes a glazed appearance, for if there be an insufficient amount of heat applied, not only will it not flow to all parts, but in addition it will result in a porous and defective inlay. In applying a flux, borax should be used, and the best results are obtained by applying it in small quantities and in the powdered form. To obtain the bite the cast can be articulated, but usually the occlusal surface can be determined by gaging the amount of solder used in casting the inlay. As plaster only is used in making an investment for gold inlays, the plaster readily

becomes detached from the surface of the matrix after the heating process, while if a mixture of sand be used some particles of sand become fused to the surface of the matrix. After removing the inlay from the investment it is "pickled" in the same solution as used in the annealing process. Before applying the inlay in the cavity grind all the surplus solder away, so that very little grinding and polishing may be required after the inlay is finally set. Before setting the inlay try it in the cavity to ascertain that the adaptation is accurate.

Before cementing the inlay the cavity should be thoroughly prepared to receive it, all the undercuts that were filled for the reception of the matrix should be removed, and the cavity thoroughly dried and wiped with alcohol.

In mixing the cement for setting the

inlay, the utmost care must be taken to thoroughly incorporate the ingredients, as the stability of the inlay will greatly depend on the thoroughness with which this step in the process is carried out. Mix the cement to a creamy consistence, then apply a small amount to the surface of the inlay, filling the cavity also, and force the inlay to place very carefully so as not to displace any more cement than is absolutely necessary in order to set the inlay. The inlay should be held in place during the setting and finishing processes in order to prevent its being displaced.

Finally, the inlay is finished by means of small stones, gold finishing burs, polishing disks, and burnishers.

The successful results obtained in filling these cavities by the inlay process is a further assurance that the cemented filling is the filling of the future.

FIFTY YEARS OF DENTAL SCIENCE, WITH ITS FADS AND FOIBLES.

By I. C. CURTIS, M.D.S., Fulton, N. Y.

(Read at the annual meeting of the Dental Society of the State of New York, held at Albany, May 10, 1907.)

WITH our ambitions and egotism in the attempts we make to conserve the usefulness of the dental organs and in the following of new fads and theories, which may live but for a short time, to give way to more sober, common-sense methods of practice, it may be well for us to take a retrospective view of the many fads that have been originated and advocated, some for a while and some for seemingly all time.

Lest we forget, let us spend a few moments in looking over the records of one of the best dental publications extant. A review of dental literature for the past fifty years will present to the dental student of today an interesting history of

dental practice, very much of which is now obsolete.

Having in my possession all of the volumes of the DENTAL COSMOS from the tenth to the present issues, I am able to give data that will convince the most skeptical that the fads of the present day are not without precedent.

THROUGH THE YEARS.

In the year 1836 arsenic as a devitalizer of dental pulps was first brought to the attention of the dental profession by Dr. Shearjashub Spooner of Montreal, and the profession was up in arms against it, claiming that it was a fraud, and that

others had tried it as far back as 1830 without success.

In the year 1840 Dr. Westcott of Syracuse, N. Y., discovered the cohesive properties of gold, and in the year 1847 lectured on the subject before the students of the Baltimore College of Dental Surgery; and it is to the credit of this same Dr. Westcott that he was the first to use plaster of Paris for taking impressions of the mouth; this occurred in 1844.

At a session of the American Society of Dental Surgeons held in the year 1847, several of its members were expelled from the society because they would not sign a pledge to abstain from the use of amalgam as a filling material in their practice. Dr. Eleazar Parmly was its president and one of the most active members in this action, although he informed Dr. John B. Rich that he had "never tried any of the stuff" and had "never experimented with it in any way."

In 1850 saleratus (potassium bicarbonate), used in making some kinds of bread, was stated to be responsible for a large percentage of tooth-decay; and a Dr. Baker asserted that in two weeks a set of teeth was destroyed that had been placed in a solution of the above-named chemical. This same year saw continuous gum work for artificial dentures advocated for probably the first time.

About 1856 local anesthesia by spraying with either "sulfuric ether" or with rhigolene was introduced. In this same year Guillois's cement was invented, and in 1871 was expected to supersede gold as a filling material.

The internal use of morphin in quarter-grain doses to obtund sensitive dentin during dental operations was advocated from 1845 to 1866.

In the year 1858 Dr. Elisha Townsend (of world renown as an advocate of amalgam for filling teeth) pledged himself never to use amalgam again for tooth-filling. (Letter to *Dental News Letter*, vol. xi, p. 169; see Flagg's "Plastics.") This took place before the "New Departure" in dentistry, as promulgated by Drs. Flagg and Palmer, and agitated the profession not a little.

In 1860 zinc oxychlorid as a filling material was advocated, and great expectations were aroused as to its lasting qualities.

In 1862 the electrolytic theory of dental decay was promulgated.

In 1866 it was a very common practice for vents to be drilled in the roots of devitalized teeth, just under the free margin of the gum, for the escape of gases. In the same year the theory was advanced—and "proved" by those who advocated it—that the wearing of a vulcanite plate would produce salivation through the mercury contained therein.

Flexible edges to vulcanite plates, and various materials for root-filling, among which were wood and cotton, were also advocated during this year, but the greatest prominence was given to the method of filling root-canals with cohesive gold throughout their entire length.

In 1868 the law regulating the practice of dentistry in the state of New York was enacted.

In the same year the capping of exposed and partly decomposed pulps was extensively advocated by some of the best-known members of the profession. Replantation after filling root-canals is also credited to the year 1868.

We also find that in this same year it was deemed good practice to tie a string around a tooth decayed on its approximal surface, in order to keep the cavity dry during the filling of the tooth.

In 1869 the use of the rubber plate was condemned, and that of Rose Pearl—another name for a compound practically similar to celluloid—was advocated in its stead.

In 1870 the American Dental Association passed a resolution to the effect that any member of the association using a show-case should be expelled.

In the same year Dr. James Truman protested against the capping of exposed pulps, for that subsequent events would prove they were dead and alveolar abscess would result. Dr. J. D. Thomas at this time asserted that after an abscess has once formed it is impossible to save the affected tooth. In the same year the administration of chloral hydrate in doses

of 30 grains was recommended to produce insensibility during extraction. The average dosage at the present time is from 5 to 15 grains, and it is used mostly for the same purpose.

During 1870 cast aluminum plates were very strongly advocated, and bid fair to take the place of the "obnoxious" rubber plate.

In 1870 the use of the heavy gold foils ranging from Nos. 20 to 240 were advocated by some and condemned by others. The same year also witnessed a controversy regarding the variety of mallets to be adopted, some favoring the light and others the heavy ones, while a third class demanded that the mallets should be covered with leather, presumably to deaden the blow.

Dr. Dio Lewis in 1871 contended that tomatoes were a constant source of menace through their power of inducing salivation when ingested. In this same year the profession was busy fighting against the acceptance of the germ theory of disease.

In 1871 methylene bichlorid, ethyl bromid, and methyl bromid were advocated as general anesthetics, and in the same year Dr. Robert Arthur published a book advocating the cutting of the approximal surfaces of teeth to make self-cleansing spaces, and by so doing prevent decay.

In 1872 Dr. Theodore F. Chupein advocated the amputation of a portion of a diseased pulp and the capping of the remaining portion, filling the cavity with zinc oxychlorid.

In 1872 the practice of applying arsenous acid for obtunding sensitive dentin became so general that it led Professor Kingsbury to present a paper to the Odontographic Society of Pennsylvania (*Cosmos*, vol. xiv, p. 137) protesting in the strongest terms against its use for such purposes. In the same year the use of zinc chlorid as an obtundent was recommended to the profession.

The year 1873 witnessed the general introduction of the magnifying glass for the purpose of inspecting dental work during filling and finishing (*Cosmos*, vol. xii, p. 597, and vol. xv, p. 153), but

more particularly when completing excavation after the rubber dam is applied, for many defects appear when dry that are not perceptible when the dentin and enamel are moist. This same year the American Dental Association condemned Dr. Arthur's book which advocated the cutting of V-shaped spaces to prevent the development of caries.

In the year 1873 we see liquid nitrous oxid gas taking the place of the cumbersome gasometers, and Dr. Beers of California patenting a gold crown, an illustration of which is given in the *Cosmos* for 1880 (vol. xxii, p. 464), which practically illustrates the gold crown of today.

The following is a verbatim report by Dr. A. P. Southwick, which appeared in 1873, giving his views on celluloid:

Last spring I invested twenty dollars in as many celluloid plates; also bought an apparatus with instructions, and followed the latter to the letter. One by one they came back on my hands, until today the last, I believe, has come, for which I thank Heaven. Some turned black as ink directly; others, well fitting and satisfactory at first, gradually warped out of shape and fit; others after two or three months' wear began to shed the teeth. In some I used plain and in others gum teeth, and where the celluloid showed between the plain teeth, the gums turned black and gave black satisfaction. Will someone who has so highly indorsed the material tell me what is the matter, and whether they have any better luck?

In the *British Journal of Dental Science* for 1874, Dr. Thomas Fletcher asserts that a plug made of cohesive gold inserted in a tooth is not watertight, while one made of soft foil can be made tight; and in the same year Dr. J. Payne in the *Chicago Medical Journal* claimed that corrosive sublimate is produced in the mouth from amalgam fillings, and asked the state medical society to favor the enactment of a law making it a penal offense for a person to fill a tooth with amalgam. Dr. C. M. Richmond in the same year advised the filling of root-canals with wood saturated with some antiseptic.

In 1875, among the various materials used in filling the roots of teeth were asbestos, gold, lead (in fine wire), cot-

ton saturated with creasote, salicylic acid, zinc oxychlorid, and chloro-percha followed with a gutta-percha point forced into the root to its apex.

The same year, C. F. Chandler, professor of analytical and applied chemistry in Columbia College, New York, made an exhaustive report on samples of saliva in which various samples of amalgamated alloys had been digested, and reported not having found in them a trace of mercury.

In 1876 zinc oxychlorid, so strongly advocated for the capping of exposed pulps, from later developments was found in a large per cent. of the cases in which it had been used to have caused death of the pulp, and a malleable amalgam which was placed upon the market was found to contain cadmium, to which likewise a share in devitalizing teeth was attributed. A controversy ensued during this year between the users of soft and cohesive gold, each side scoring; mesmeric anesthesia was introduced at this time for the extraction of teeth.

Among other things of note in 1876 was an exhibition by Dr. T. C. Stellwagen of Philadelphia, which consisted of a tooth transplanted from a human mouth to the comb of a cock. The tooth was firmly attached, and while the pulp had become devitalized the pericementum remained active. This result gave an impetus to the replanting, transplanting, and implanting of teeth in the human jaw.

In 1877 it was discussed and advocated before the New York Odontological Society that all exposed pulps should be freely bled and capped immediately afterward with some plastic material, and the cavity of decay at once permanently filled.

In 1878 Dr. J. Foster Flagg presented a paper in which he gave his experience with the interrupted electric current in extractions and for the obtunding of sensitive dentin, claiming success in 94 per cent. of two thousand cases.

In 1879 a paper advising the extraction of roots and attaching porcelain crowns to them, and afterward replanting the reconstructed roots was read before the

First District Dental Society of the State of New York.

During 1881-82-83 the Bonwill, Weston, and How crowns were prominently brought to the attention of the profession.

In 1883 the collar crown, of which the Richmond is but a modification, was invented by Dr. Wilbur F. Litch, and following this, bridge work came into general use.

In 1884 cocain was tried unsuccessfully for the obtunding of dentin, but it was not till 1886 that it was successfully used in extractions by the hypodermic method. Subsequent results have proved, however, that it is fraught with its share of unpleasant results.

In 1886 glass as a material for inlays was suggested, but it was in 1862 that Dr. B. Wood gave to the public the plan he had adopted of making inlays of porcelain. The merits and demerits of inlays have been a theme for controversies up to the present time.

In 1887 copper amalgam became one of the fads, but it was denounced by the late Dr. Flagg as untrustworthy, and he advised against its use. In this year we also find immediate root-filling after extirpation of a vital pulp as one of the new things given to the profession.

In 1889 the implanting of metallic capsules in the jaw, to serve as anchorage for artificial dentures, is described in the *Cosmos* (vol. xxxi; p. 232).

In 1890 cocain cataphoresis for obtunding sensitive dentin and for the painless extirpation of exposed pulps came prominently before the profession. The operation was performed with varying degrees of success, seemingly on account of defective apparatus or lack of knowledge of electricity on the part of the individual operator.

The use of methyl chlorid spray on sensitive dentin dates back to the year 1890, while at the present time cocain pressure anesthesia is one of the boons to the tired operator dealing with exposure of a pulp which must for good reasons be extirpated and the root-canal filled immediately.

We are now awaiting results of the so-

called insoluble cements, and the operator of five years hence will have the benefit of our experience.

It is not the purpose of this paper to either extol or decry the practice of preceding years, but I leave it for the in-

telligence of the dentists of this century to separate the wheat from the chaff, and perhaps incidentally be convinced that all that has been written on dental subjects has not borne the test of actual practice.

TREATMENT AND FILLING OF ROOT-CANALS.

By NELSON T. SHIELDS, D.D.S., New York, N. Y.

(Read before the Dental Society of the State of New York, at its annual meeting, Albany, N. Y., May 10, 1907.)

THIS subject, like all others appertaining to the teeth, cannot be explained by any individual case, and my endeavor will be to cover all conditions as thoroughly as possible. This strenuous age causes more congestion in the gums than can be tolerated by the alveolar process, resulting in an exposed root at the neck of the tooth at comparatively an early age. This exposure of the root is very irritating to the pulp through the dentinal fibrils, causing the odontoblasts to throw out a calcified mass at a point in the pulp nearest the exposed root. Blood having to circulate beyond this calcification will cause congestion of the pulp if the calcified mass is large enough. Fillings at the cervical margin are liable to cause the same result. Pulp-stones throughout the entire pulp, and even calcification of the pulp, are caused by peripheral irritation. All of this class of cases where, in your judgment, disastrous results will follow, together with cases where the pulp should be extirpated for serviceable and artistic abutments for bridges, should be treated as follows: Apply the rubber dam and open into the pulp with sharp burs, manipulating them gently in order to avoid the infliction of pain. When the least particle of the pulp has been exposed, apply a saturated solution of cocain under pressure, and painlessly extirpate the pulp. The thorough extir-

pation and cleansing of the canals by mechanical means is the principal feature of the treatment. Use new sterilized broaches, and sterilize the root with carbolic acid, removing all coagula if hemorrhage follows.

It is a temptation at this time to immediately fill the root-canal or canals, but it is safer to wait until the next sitting, at which time one may feel reasonably sure that the extirpation was thorough and complete. The broach from the beginning should be carried to the canal through a puncture in a small piece of rubber dam, which can be made with a rubber-dam punch, using the molar hole of the punch. This rubber placed at a given point on the crown of the tooth will show the exact length of the tooth. A root-plugger should be made with a Donaldson bristle, using as previously a rubber indicator to ascertain the exact length of the canal from apex to grinding or cutting surface, and the pointed end of the bristle be excised to the size of plugger desired, and then flattened.

Root-canal filling is a surgical operation, and exactness and thorough filling should dominate every other requirement, including that of speed. The apical foramina of all teeth are small, and they should not be enlarged or penetrated.

A narrow strip of gold can be readily

picked up with the flattened plugger and carried to the apex, and the apical foramen sealed. The gold will occupy a definite space, for one strip of gold about the width of the shaft of a pin (using Abbey's No. 4 non-cohesive gold) and an inch and a quarter long will usually occupy a space equivalent to about the twentieth of an inch. To fill the canal a larger plugger can be used, because the apical portion is smaller than that portion of the canal the twentieth of an inch away from the apex. Use a rubber indicator on this plugger as before, and fill the canal with a material that will not only fill it perfectly, but through its affinity for moisture will also have a tendency to fill the microscopic tubules; zinc oxychlorid is such material. It can be gently packed against the gold at the apex and throughout the canal, the indicator coming farther and farther away from the crown as the cement is gently packed. When a tooth of the character described is filled in this manner, not only will you never hear of it in the future, but the operation is perfectly performed in the shortest possible time. Teeth with exposed pulps are treated and filled in the same manner.

In cleansing root-canals all sizes of broaches should be used; the opening of the canal should be enlarged with broaches of the full diameter of the canal, and under no condition use Gates-Glidden drills or any other drill in the engine. All difficult bifurcated canals can thus be cleaned. The Downey and Kerr broaches are very useful in opening into small canals, but for cleaning the canals the Donaldson and the "Realization" nerve broaches are the best. One treatment with carbolic acid

at the apex, and one with alcohol at the time of preparation for filling, in the above cases, will give perfect results.

In molars and bicuspsids, especially in molars, that are about to become the seat of abscesses, the use of Dr. Buckley's tricoresol and formalin combination is good practice, but even then I depend upon the thorough mechanical cleaning, which can be more readily done after using the tricoresol and formalin combination. I use in these cases dilute sulfuric acid, following with carbolic acid in just the same way as though the tricoresol and formalin had not been used. In anterior teeth that are in this condition I never use tricoresol and formalin, on account of the trouble in bleaching. Where an apex is very large we are justified in either fitting a lead plug, carrying it to the exact spot, twisting it off, and then filling the canal with zinc oxychlorid, or else using at the apex a strip of tin foil, just as gold would be used.

In cases where a large opening has been made near the apex through the side of the root, tough gutta-percha can be used to advantage. In the latter cases the individual equation plays a most important part. In all teeth that are visible, no chemical should be used that will discolor them. Carbolic acid can be neutralized with alcohol, but I never use carbolic acid in the crown portion of an anterior tooth, only at the apical portion. Dilute sulfuric acid will not discolor, neither will eucalyptol nor peppermint oil. As dentistry is mostly surgical we can accurately calculate the result of every action, and should always have in view the perfection of workmanship, together with the contour and color of the teeth.

TRAUMATIC LESIONS INCIDENT TO CROWNS AND BRIDGES.

By J. CLARENCE SALVAS, D.D.S., Philadelphia, Pa.

(Read before the Pennsylvania State Dental Society, at its annual meeting, Pittsburgh, July 9, 1907.)

THE distinguishing difference between ancient and modern medicine is that the former expended its efforts to cure, whereas the latter endeavors to prevent disease. What is true in medicine is equally true in dentistry. Oral *prophylaxis*—preventive dentistry—is pre-eminently the essential need of the times.

The functions of innervation and circulation are precisely the same in the mouth as in every other part of the body, as are also the laws which govern repair and wasting, nutrition and growth. In view of our advanced knowledge of physiology, histology, etiology, and pathology, we cannot but recognize the importance of combating and instituting methods for the prevention of injuries and diseases of the supporting structures of the teeth.

It is a noteworthy fact that we have been so engrossed with dental prosthesis, and that our energies have been so involved in the restoration of diseased teeth, that we have become in a large measure oblivious to the frequency and the seriousness of pathological conditions of the soft tissues.

Our distinguished investigators have pointed out from time to time that inflammatory and suppurative diseases of the mucous membrane and the alveoli are etiological factors in systemic disorders. Diseases of this character may exist for years without the knowledge of the patient. They progress slowly, yet assiduously, and are responsible for a constant exudation of pus and gangrenous tissue which gains access to the deeper structures of the body through the process of ingestion.

The teeth and the contiguous tissues are an integral part of the human economy. They occupy, physiologically speaking, a position relatively as important as that of any other organ of the body; hence the significance of every surgical and therapeutic means of preserving their integrity and usefulness. The intimate relationship between the teeth and the soft tissues of the mouth and the general system is dependent upon the dental pulp and the pericemental membrane. The obvious function of the dental pulp argues its preservation; but to the matured tooth the preservation of this organ is of secondary importance to that of the pericemental membrane.

Allow me to call your attention briefly to the structure and the function of this tissue. It consists of a fibrous connective tissue differing from the gum tissue in that it is not so dense. It is richly supplied with nerves and blood-vessels; it invests the roots of the teeth and lines the walls of the alveoli, passing into the gum tissue at the necks of the teeth. Its function is to afford nourishment to the bone on one side and to the cementum, to which it is closely connected, on the other. It also serves as a cushion to lessen the concussion and strain incident to mastication.

Let us go a step farther and consider the gum tissue. It consists of a layer of tough, fibrous, and very vascular tissue covering the alveoli, and is closely attached to their periosteum. At the necks of the teeth, to which it is closely molded, it ends in a free margin. In this region, as previously stated, it unites with the periodontal membrane.

It can be readily understood from the foregoing that these tissues, owing to their association by both continuity and contiguity, are frequently the seat of various nutritive and functional disturbances. Clinical experience and observation have taught us that a large percentage of these disturbances may be attributed to an injury or trauma produced by a crown or a bridge. The ancient idea of regarding the teeth as semi-extraneous organs with little if any vital relation with the bodily economy seems to be more or less prevalent at the present time, judging from the methods frequently employed for the restoration of lost dental organs—methods which in themselves are largely responsible for serious pathological conditions.

It is not surprising—indeed, it is to be expected, when we consider the nature and character of the teeth and their supporting structures—that the insertion of a mechanical appliance invariably produces a traumatism that did not exist before. This at first manifests itself in a slight alteration of the gum tissue in the festoon and in the folds of the interdental spaces, and is generally followed by a break in the very delicate union between the gum tissue and the pericemental membrane. The breaking of this attachment is the initial stage of root-infection—a condition which, if not recognized and not corrected, will sooner or later develop into interstitial gingivitis and phagedenic pericementitis, with the final exfoliation of the tooth.

SOME CASES.

Cases such as the one about to be described are frequently met with in practice, and are illustrative of the deleterious effects of a band crown:

Case I was that of a young woman in good health, who had been annoyed with an excessive bleeding from the gum about the left central root, which supported a half-band crown. I inserted the crown twelve months previously, and I am confident that the band was as accurately adapted to the root as was possible under the circumstances. The trouble began with slight bleeding following the use

of the tooth-brush. It gradually grew worse until a mere touch from the tongue or the food produced a hemorrhage that was both annoying and embarrassing. When she reported to me, the gum on the palatal surface was swollen and almost covered that aspect of the crown. I was able to pull it away and expose nearly two-thirds of the root. The band was removed and the pocket treated with antiseptic solutions, after which the trouble subsided.

While this is not a rare case, it is an extreme one. These cases all begin with a trauma resulting from the presence of a foreign substance; this invariably leads to a simple marginal inflammation which is the beginning of the degeneration of the pericementum, leading to its subsequent atrophy and death. The result is a series of toxic disorders in consequence of the presence of pyogenic organisms.

The following case exemplifies those conditions which cause more or less pain in parts remote from the seat of the trouble:

Case II. The patient, a man of forty, had enjoyed good health up to the time of his present trouble. For three months he suffered severely from facial neuralgia. The pain would extend from the canine fossa to the temporal and occipital regions. His physician treated him for three weeks, and as he was unable to give him permanent relief he sent him to an oculist, who, on finding that the eyes were not the cause of the trouble, suggested that he consult a dentist. He came to me with a letter containing a general history of the case. His mouth presented the appearance of having been well cared for; the teeth were singularly free from deposits and caries. On the upper right side he wore a bridge extending from the second molar to the second bicuspid. It consisted of a molar and bicuspid shell cap and two dummies; the bicuspid cap was attached to a gold inlay which was inserted into a cavity on the coronal surface of the first bicuspid. The tissues about the abutments looked so well that a casual examination failed to reveal any suspicious condition. It was accidentally that the probe entered a pocket and passed almost to the apex of the root of the second bicuspid. On withdrawing it, considerable pus followed. With an abscess syringe, the point extended well into the pocket, I injected a warm saline solution. The patient at once remarked that he felt it in the nostril. The diagnosis was completed. The

connection between the crown and the inlay was severed, the molar cap split, and the bridge, including the second bicuspid abutment, which was very loose, removed. On further examination I found that the root had perforated the antrum. The opening was enlarged and the condition treated accordingly. The second day the patient reported that for the first time since the beginning of his trouble he had had twenty-four hours of absolute freedom from pain.

Careful investigation revealed the fact that the original cause of the disorder was a persistent irritation of the soft tissues for which the bicuspid cap was responsible. On the palatal surface it extended nearly an eighth of an inch above the gum margin. A trauma was produced, which, under bacterial influence, assumed a toxic character.

These disease conditions may exist and progress for an indefinite period without the knowledge of the patient; indeed, owing to their remote manifestations, they frequently escape detection by the specialist. In this case the bridge was skilfully and artistically constructed, but the operator failed to consider the relation of the bridge in all its phases to the soft tissues.

Case III. A man of fifty, with strong, healthy teeth firmly held in their sockets. He wore a bridge extending from the lower second molar to the first bicuspid. After twelve months the abutments became so loose that they with the bridge were lifted out with a napkin.

This is a typical instance of functional abuse brought about by the over-use of the teeth supporting the bridge. The over-working of a tooth, whether it be the result of malocclusion or of lateral strain, is first manifested by over-stimulation of the pericementum, causing a more or less passive dilatation of the pericemental vessels. The result is seen in atonic hyperemia, followed by the degeneration of the pericementum and finally exfoliation of the tooth. This occurs frequently with bridges of the abutment type inserted after the fiftieth year; at this time of life the tissues are more susceptible to degenerative changes.

RESULTING CONSIDERATIONS.

It is obvious, therefore, that pathogenic conditions of the pericementum and the alveoli exert an influence that is far-reaching, extending from local osteitis and necrosis to pyemia, septicemia, and septic gastritis—to say nothing of disturbances of the eye, ear, nose, and throat. It should be noted, however, that a trauma caused by a mechanical irritant may or may not be of a septic nature. Indeed, that injuries do not all develop into septic or toxic conditions is surprising when the environments are considered.

The mouth is an incubator perfectly adapted for the propagation of bacteria. It possesses the necessary elements for their development, *i.e.* heat, moisture, and oxygen. Burkhard tells us in his excellent work that "The mouth swarms with bacteria of several classes: lactic, acetic, and butyric acid ferments; numerous saprophytic fungi, and organisms producing specific disease conditions when introduced into the tissues. The pyogenic organisms are almost constantly present." Clinical bacteriology has demonstrated that nearly every part of the body may be affected by micro-organisms originating in the mouth. While many species are harmless, there are innumerable varieties which are pyogenic in character.

The science of bacteriology is comparatively new, and just in proportion as it has developed has the practice of dentistry evolved from the mere application of mechanical art to that of a science. Not only has it liberated us from the circumscribed methods of forty or fifty years ago, but it has brought us in touch and has established an indispensable relation with the medical profession. That body recognizes now more than ever before that conditions of the oral cavity are causative factors in systemic diseases.

Preventive dentistry must seek to remove the sources of functional disturbances within the oral cavity. If we may assume the accuracy of the foregoing observations, it is obvious that we are in a

large measure instrumental in creating diseases as fast as we can cure them. A careful and unbiased survey of clinical experiences will reveal the fact that a large percentage of disorders of the mouth may be traced directly to injuries from crowns and bridges. It is not the purpose of this paper to deprecate this means of restoring dental organs—on the contrary, the writer fully appreciates the intrinsic value of this prosthetic measure; but rather to call attention to the importance of instituting methods of practice that will counteract all possible traumatic lesions.

A crown or a bridge that is not de-

signed so as to obviate any traumatic lesions and to provide against germ culture must sooner or later defeat its own purpose.

In conclusion, let me summarize by reiterating that suppurative diseases of the pericementum and the adjacent tissues are causative factors in serious systemic disorders; moreover, they are in many instances the result of an apparently insignificant injury which may be traced to an ill-fitting or improperly constructed crown or bridge. Preventive scientific dentistry must take cognizance of these facts.

CORRESPONDENCE.

DISTAL CAVITIES IN DECIDUOUS SECOND MOLARS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Permit me, as one of the younger practitioners of our calling, to take up a few lines of space in your journal to protest against the pernicious advocacy, in the treatment of distal cavities in the deciduous second molars, of grinding the distal cavity away, thereby forming a V-shaped space between the first permanent molar and the second deciduous molar. Occasionally this method gets into print. In July Cosmos, 1907, page 757, Dr. L. C. Bryan of Basel, Switzerland, says, "Soon after the eruption of the first permanent molar, if we should find the slightest decay in the distal surface of the second deciduous molar, we should . . . grind away the distal surface of the latter, in order that we may protect the newly erupted permanent tooth."

This has been the practice of many of the older practitioners, and my advice to the young men who should read this,

is—"Don't!" Why? Because such an operation is productive of an irregularity to the permanent teeth—ofttimes to a marked degree—by allowing the first permanent molar to move forward into the V-shaped space formed.

Angle says, "The mechanical influence of the deciduous teeth in the development of the dental arches is so important that they should not only . . . be retained their full normal period, but if affected by caries their full mesio-distal diameter should be restored by suitable fillings."

One of the functions of the first permanent molar is to lengthen the lateral halves of the dental arches, by forcing its way between the second deciduous molar and the ramus of the jaw—or the tuberosity. Therefore it will clearly be seen that to grind a V-shaped space will allow the incoming permanent molar to expend its objective force in moving itself into the space gained, and not forcing the lateral halves of the jaws forward—pro-

ducing thereby a malocclusion of the permanent molar or molars, often forcing the first bicuspid into a buccal or lingual occlusion (see Fig. 131, Angle), and often producing an inequality between the jaws on either half, or per-

haps resulting in a case of protrusion of the upper incisors.

This is a small point in diagnosis, but oh how valuable!

G. B. MITCHELL.

BUFFALO, N. Y., August 1, 1907.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-ninth Annual Meeting.

FIRST DAY—*Morning Session.*

THE thirty-ninth annual meeting of the Dental Society of the State of New York was held in the assembly hall of the Hotel Ten Eyck, Albany, May 10 and 11, 1907.

The meeting was called to order by the president, Dr. W. A. White, at 10 o'clock on the morning of the first day, Friday, May 10th, and was opened with prayer by Rev. Dr. Charles E. Hamilton, Trinity M. E. Church, Albany.

The first business was the calling of the roll by the secretary, Dr. C. S. Butler.

The vice-president, Dr. W. S. Rose, was called to the chair while the president, Dr. W. A. WHITE, read his annual address, as follows:

PRESIDENT'S ADDRESS.

Gentlemen,—We have again assembled in convention at this the thirty-ninth annual session, and I regret that it is my duty to report that since our last meeting, through the will of an all-wise Providence, four of our professional brethren have been called to that bourn whence no traveler ever returns. Two

of those referred to were engaged in active practice, and interested in the welfare of this society.

Dr. C. W. Stainton, who so ably and faithfully served us as treasurer, and also took an active part in the transactions at our meetings, was called to his home beyond, on June 6, 1906. Dr. Stainton was an upright, conscientious man in all that he did, and while at times he differed with his associates on many questions, he advocated what he believed to be right and for the best interests of the society and the profession. His presence will be greatly missed for a long time to come.

Dr. F. H. Lee, quiet and dignified, strictly ethical, enjoying a lucrative practice in the city of Auburn, surrounded by a delightful home and family, highly respected by his professional friends in both the State and Seventh District Societies, after three years of patient suffering, passed away October 23, 1906.

Dr. F. D. Nellis of Syracuse, who became a member of this society in 1881, and who until ill-health prevented his attendance was always with us, died November 20, 1906.

Dr. Cornelius A. Marvin of Brooklyn, who so ably served you as president du-

ring the years 1872 and 1876, and who contributed many valuable scientific papers during his association with this society, died at his home in Brooklyn, December 21, 1906.

During the past year it has been my pleasure to visit nearly every district society in the state, and at each one I was delightfully received. It is with a great deal of pleasure that I report all of the societies to be in a most flourishing condition, with an evident indication of an unusual amount of interest shown in the direction of membership and attendance at their respective meetings. These meetings were largely attended by young men upon whom the future success and prosperity of this society must depend, and most of whom are strangers within our gates.

During these official visits I learned that there is a prevailing sentiment existing in nearly every district that the State Society is exclusive and reserved, and this accounts for the seemingly limited membership, when the number of practicing eligible dentists within the borders of our state is taken into consideration.

The highest ideal of man is governed by his environments. To be a member of the Dental Society of the State of New York is an honor which I believe every man who enjoys that privilege should esteem and should consider a badge of professional merit. Professional intercourse with the men who constitute this organization elevates the mind, and brings us in touch with the higher plane of professional being. It is here that our mental laboratories are strewn with rich gems of thought, which when associated with actual practice bring us in closer relation with what we, as members of a scientific body, should embody in the art which we practice, and thus we are developed, mentally, professionally, and socially. It is not numerical strength, but ability and character that should be the basic principle of our society.

While I do not advocate the open door, I recognize the fact that there are many men within our ranks who should be en-

rolled on our membership list but are debarred on account of the limited number admitted each year. In order that this restriction may to a certain extent be obviated, I recommend that the word "sixteen" in the third line of Section 9 of the By-laws be changed to "thirty-two," so that the by-law shall read, "No more than thirty-two permanent members can be elected by this society in any one year," and that Section 38 be changed so as to read, "Each district society shall have the privilege of electing four permanent members each year," and that the balance of the section as it now reads be stricken out.

It is a recognized fact that one of the principal factors of all dental meetings, and one which in no small measure contributes to their interest and success, is the clinics, which present many valuable practical ideas and oftentimes aid us in overcoming what seemed to us insurmountable obstacles. In the words of Patrick Henry, "I have one lamp by which my feet are guided, and that is the lamp of experience." Thus, recognizing the growth of attendance where clinics are prominent, coupled with the fact that sufficient time cannot be allotted them with only a two days' session, I recommend that, beginning with the fortieth annual meeting, we hold a three days' session, the last day of which shall be entirely devoted to clinics. This change will afford ample time for a thorough discussion of the essays which are each year presented, and from which in many instances interesting and instructive points are eliminated on account of the lack of time for a thorough discussion, which is a courtesy certainly due to the essayist, who spends much time and study in the preparation of his paper.

We have among our members many associates who possess every qualification to ably fill the office of president of this society, an honor which anyone should certainly appreciate; but with the habit of re-electing the executive for a second and third time, which has prevailed since the birth of this organization, our society has in many instances lost the services of men who would have accom-

plished much toward the advancement of our society and its object. Thus, in order that the best interests of the society may be served, I recommend that the term of the office of president be limited to one year.

I also indorse and reiterate the recommendation made in 1904 by our ex-president, Dr. R. H. Hofheinz, that a Committee on Exhibits be appointed to have full charge of the exhibits, which is now incumbent on the Committee of Arrangements.

The Dental Society of the State of New York since it was organized has upheld and maintained a standard of professional attainment, and at the same time advocated such legislation as would best promote and advance the standing of its members and the practice of dentistry. Its requirements in order to engage in practice have done more toward the elevation of the profession and toward higher dental education than any other similar organization. Our laws have accomplished much, not only within our own state, but they have likewise commanded the respect of our sister states, and have had much to do with the enactment and enforcement of dental laws in many of them.

While there is yet much to accomplish within our own domain, we must not lose sight of one great and important question which is attracting widespread attention, not only at home but as well among our *confrères* abroad; and while no definite or legal action has yet been taken to accomplish "dental reciprocity," or "interstate comity," why should not this society give this important matter due consideration? While we are knocking at the door of Europe for admission, we refuse this inherent right to our own duly authorized licensed graduates to practice, except within a circumscribed limit.

I believe that every man who possesses a diploma granted by a reputable dental college, or dental department of a reputable university, should be entitled to practice wherever the emblem of these United States floats. A step in this direction was taken in 1899, when an in-

terchange of licenses was effected between this state and New Jersey, and a little later the same reciprocity was arranged between these states and Pennsylvania, and is still recognized. If between these three states, why not all the others? "To stop is almost as tragic as to retreat." I therefore advocate and recommend the appointment of a committee of three to act in conjunction with a similar committee from other states and territories, to consider the feasibility of an interstate dental law. This recommendation is suggested by the many letters approving such a law received by me from all sections of this country, following the reading of a paper on "Interstate Comity," at Rochester, in 1906. While these several suggestions may not meet with your approval, they are given with a spirit of interest in the welfare of this society and of our profession.

A glance at the program bespeaks the esteem and estimation in which this society is held by those of other states. To those who have contributed to the success of this meeting I wish to extend not alone my individual thanks, but the thanks and appreciation of the entire society for their presence and valued assistance.

Permit me at this time to also thank the members of the society in general for the generous response I have received to all calls for assistance in fulfilling the duties incumbent on the president of this society.

Dr. Rose announced that the President's address would be referred for consideration and recommendation to the society, to the following committee: Drs. H. J. Burkhart, W. J. Turner, and Wm. Carr.

The President then resumed the chair, and the Business Committee, through its chairman, Dr. Burkhart, reported the program for the annual meeting as that prepared by the committee.

On motion the report was adopted.

The President then announced as the first order of business the reading of a

paper by Dr. A. H. PECK, Chicago, Ill., on "The Value of Association."

[This paper is printed in full at page 1030 of the present issue of the *Cosmos*.]

Discussion.

Dr. R. OTTOLENGUI, New York. Mr. President, I consider this distinctly an occasion—a very important occasion. We have listened to an exceptionally beautiful paper on a subject of much greater importance than I believe one-half of those present realize. We have been led through a beautiful range of metaphor, through solid facts, down to the logical deduction—the value and importance of association; but the significant and I think the most interesting point is that the essayist who brings this message to us is the president of the National Dental Association, and that he reads that paper before the Dental Society of the State of New York; the point of significance being that a recent amendment to the constitution of the National Dental Association has practically disfranchised the members of the profession in the Empire State and made it difficult, indeed impossible, for them to become members of the National Dental Association. And I propose to discuss this point with you and ask whether it is our fault or the fault of the National Association.

You may think that organization and association are synonymous terms; they are not. An organization is a body of men joined together under a constitution and limited by that constitution. If the constitution of the organization is so formulated you may have a large association, but it may be so framed that you would have a very limited association. Now, then, if it be important, as the essayist tells us, that the dentists of New York—that the dentists of the United States—should be an associated body, it becomes necessary for all organizations to revise their constitutions and remove those limitations which tend toward the prevention of association.

What are the conditions to which I have specifically alluded? The National Dental Association at its Buffalo meeting

passed an amendment to the constitution that no one may become a member of the National Dental Association unless he be a member of his state society. That immediately makes it impossible for every practitioner of dentistry in this Empire State to become a member of the National Dental Association, unless he enters through the narrow door of this body. How narrow is that door? Very narrow. In the first place we are limited to a very small number of men allowed to enter this body annually. Secondly, this limited number must reach the door of membership in this body through a very narrow path. They must come here elected from their district societies. Let us analyze that: We will take a man at the other end of the line who would like to be a member of all of these associations, the local, state, and national. How long must he be a practitioner in New York before he can become a member of the National Dental Association? He must first affiliate himself with the district dental society. He must become sufficiently prominent to be elected one of the limited number of men sent annually to this body as delegates—then and then only does he become eligible for membership in this body; then he must take his turn to be elected as one of the very limited number to become a member of this body. How can the dentists of New York State respond to the appeal of the president of the National Dental Association and join the National Association so long as our State Society constitution and the constitution of the National Dental Association make it impossible for them to become members of the National? And yet we have the president of the National Association making a plea for association, when the constitution of his society and that of our society make it impossible for the vast bulk of the men in the Empire State to ever get into the National Association!

How is it in other states? I want to make the point that the dentists of this state are the most organized and at the same time the most unassociated set of dentists in the United States. We not

only have a great many more societies than we need, but there seems to be a constant and determined effort to make more societies, and every society to have some internal clause which limits the membership, or with requirements which make it impossible to become a member of the National Dental Association. How is it in the West? In Illinois—and I understand the plan is being followed in other states—when a dentist joins the local society he immediately becomes a member of the state society. There is practically one society in the State of Illinois, with local branches. Now, gentlemen, if we really want association there is but one logical plan: Go back to our constitutions throughout the United States and take away these limitations which make it impossible for men to become associated with us.

It has been said by one of our ablest editors that no man should criticize without offering a remedy. I therefore will suggest a remedy, which I know would require a long time but which is the only remedy that can come, and that is to reorganize our National Association more along the lines of the American Medical Association. In other words, let the association be an association of state organizations. Let every member of a state society be a member of the national body, and this national body to exist as a delegate body. Then let every member of the local society be a member of his state society and let him pay one fee for the whole proposition. Let every dentist who enters a dental organization become at once and for one fee a member of the local, state, and national body. Then let your executive body, which shall be limited, manage the affairs of your association. For instance there might be, as I believe there is in the American Medical Association, a house of delegates, which could conduct the business of the National Dental Association, and that house of delegates should be composed of delegates from state societies sent *pro rata* to their membership, for that purpose. So that your business body would be an exact *pro rata* representation of your state societies throughout the United States.

Under the present plan there are forty-five thousand dentists in the United States, but there are only between six or seven thousand who belong to any organized dental body; and of these six or seven thousand men who have shown a desire for association, about ten per cent. only are in our National Association. And yet we ask for an independent dental journal. Gentlemen, we cannot have an independent dental journal without this association of dentists for which the essayist has made a plea. But even if these organizations, including these six or seven thousand members of organizations throughout the United States, were members of the National Association, and were paying say one fee, of a stated amount, which would be divided *pro rata* between the local, state, and national organizations, every one of these men entitled to the organ of the association, you could then have a really professional independent dental journal—one that would be handed to every member of this tremendously important American Dental Association; and you cannot get it in any other way. (Applause.)

This is the seed I wish to sow; let it take root and fructify so that we will have the courage here today before we leave this meeting to appoint a committee to revise our constitution and by-laws so that this organization shall immediately contain as its membership the entire membership of the districts of this state, and build this up into a representative body.

Let me tell you, gentlemen, if you do that, every important society in these United States will follow suit, and within five or ten years I prophesy that we will have a really great National Dental Association—not an organization, but a national dental association.

Dr. WM. JARVIE, Brooklyn, N. Y. In the essay that we have listened to with so much interest and pleasure there is contained this doggerel:

What sort of an association
Would our association be,
If all the members
Were just like me?

Now, I can answer the question put by the essayist in reference to this by saying that it would be infinitely better than it is if all the members were just like him. He, as president of the National Dental Association, has shown to us what he is and what he has been through many years of active dental practice and activity in dental organizations, and I assure you that our association, if composed of members entirely such as he is, would be the greatest association in the United States. I do not know but that it is so already, but it would be much better than it is today.

The paper commences with an interrogation—in fact the title itself is an interrogation, as to “The Value of Dental Association,” and I think the dental profession is the very best example of the value of association. For I am one of those who believe that the present standing of the profession today in the world at large is very greatly due to associations—not necessarily from organizations, and yet it is from organizations that we get association, for it is impossible for two intelligent dentists to spend an hour together, with their conversation naturally drifting to their profession, but that these men will separate both having been benefited the one by the other. It may perhaps be by only a suggestion that finds its development in some method of operating, or in their theory of treatment of disease—or something of that kind.

In the history of dentistry, going back say forty-five or fifty years, to the time when there were practically no organizations, or only a few, in the country—and now we have organizations all over the land, and active associations, associations productive of an immense amount of good; and it is through these associations that the new ideas, new theories, new suggestions are promulgated through the proceedings of the societies and associations as published in the dental journals and of which the journals are largely made up. There are very few papers that are published but whose first appearance was in some association meeting; so that our dental journals are prac-

tically the results of our association meetings.

Now, Dr. Ottolengui has spoken with special reference to the National Dental Association—its organization, and its lack of broadness. I do not think that it would be wise to have the door of the National Dental Association so wide as to embrace within its membership all the dentists of the country. He has told you that there are about forty-five thousand dentists in the United States. If anything like one-third or one-quarter of that number should be members of an association, just think what an unwieldy body it would be! It should be a representative body, something like the Senate of the United States, for membership in which the dentists who enter the profession and join the local dental societies can afford to wait. They are not fitted to take part in the discussions of papers such as should emanate from the National Association; it would take some years to educate them up to that point, and if they had to wait they would be the better qualified and the National Association would also be the better for it.

I believe in association of some sort for every reputable practitioner—an association of some kind for every class of dentists in the country, and some for men who are interested in the same phases of dentistry, which has become so broad that it is almost impossible for one society to embrace all its branches and phases. Dr. Ottolengui is an exemplar of that himself—as he is, or was, president of the American Society of Orthodontists. Men who are specially interested in orthodontia and devoting almost all of their time and thought to that branch of the profession—is it not wise that they should segregate themselves at times and discuss only matters pertaining to orthodontia. We get results of that plan, in a general way, in the National Association. I believe the organization of the societies in New York State is one of the best in the United States. I believe it is desirable for the district societies to have in their membership all the practicing dentists in that vicinity, but do not believe that all these should have mem-

bership in the State Society at once. They should be educated up to the desire for membership in the state and national societies. There has come up, I believe, during this session a discussion in regard to the representation of the districts in the State Society, and I believe the matter has been considered in the second district to formulate a plan by which the representation of the districts would be increased in the State Society, in that way enlarging it, while through such enlargement the National Association would be very much enlarged in membership.

I quite agree with Dr. Ottolengui in his desire for a journal, and I think it would be a good thing, but I do not know that any journal could better represent what is going on in the dental profession than those we have today. They are commonly called trade journals, but they are not restricted at all in their professional matter, as I understand, by the dental concerns who have charge of these journals. We have an able exponent of that in Dr. Ottolengui, and again in Professor Kirk of the Cosmos. There are no abler exponents of dentistry in the United States, in the way of dental journalism, than these men at the head of the so-called dental journals. So that I am not so great an advocate—at least I do not see the immediate necessity—of an independent journal quite as much as some others. I think that it would be a good thing for the profession, but that we are not suffering for the want of it at the present time.

I want to say a word in reference to the character of our dental associations—by the character I mean the membership that goes to make up these organizations—and the necessity for every man to take an active part in them. When I went over the State of New York some two years ago during the term of my presidency of the State Society, and visited the district societies, I was delighted with the experiences I had in seeing the intelligence and progressiveness displayed in all these organizations. Yet there are a great many men who are not members of the district organizations, and I think

it devolves upon every member to secure other members, to bring in others who are outside the pale as far as the associations are concerned, and let them have the same benefit. In doing that we improve the societies, improve the condition of the dentists in practice, and so improve the condition of the profession at large. And I do not think that the essayist emphasized too strongly the value of professional association, and I trust that as time goes on we may have a progressively larger percentage of the dentists in all parts of the country among the active working members of the associations. I know that some young men just starting out say that they cannot afford to give up two or three days to attend these meetings, or the necessary expenses. Such men cannot afford not to be members! It is through the associations that they will be inspired to new and better and more advanced efforts in their field of work.

Dr. M. D. JEWELL, Richfield Springs. I am in full accord with the essayist in what he has said about association, and with what Dr. Jarvie has said, but am only partially in accord with Dr. Ottolengui. I do not believe in throwing open the door of the district societies too widely. Do what you like as to throwing open the door of the State Society, but not of the district societies. We have, among the forty-five thousand dentists in the United States, many whom for good and sufficient reasons we would not like to see in the district societies. I believe that if we throw open the doors of the primary organizations too widely we may be sorry for it. There is an immense amount of gall characteristic of a certain class of dental practitioners, and we want the district societies to be, if you please, a sort of ductus choledochus communis to turn aside this gall into its proper channel. I think the men who projected our constitution and the present arrangement of the district and state societies builded better than they knew; the arrangement is a good one. The state and national bodies should consist of the biggest men of the profession, and membership should be acquired by a natural

process of gravitation. A farmer starts to market with a load of potatoes, and by the time he has reached town the big potatoes have gravitated to the top; and so with our state and national associations, the farther we go the bigger the potatoes.

I hope something will be done at this meeting to broaden the doorway to the state and national societies, but, gentlemen, do not open the doors to the district societies too widely.

Dr. C. S. BUTLER, Buffalo. I want to call the attention of the society to some of the privileges that we now have in the district societies which we do not fully appreciate or take advantage of. But let me speak first of our own State Society. I am in full accord with all that has been said by the previous speakers in regard to extending the limitations of our State Society as something to look forward to, but I am not satisfied that the time has yet come when it would be a wise step to take, and I think you will agree with me in this when I say that even now, with the opportunity of electing annually sixteen members, there has not been a year when the full quota has been elected and accepted membership in the society, showing that there is no very great pressure or desire on the part of district members to come into the State Society; and the effect of making membership compulsory would be the loss of a very large percentage of the district members who are now in training and being educated up to a desire for membership in the State Society. I am not in accord with the suggestions of the president that we let out another link in the chain of acquiring members in this society by increasing the number to thirty-two annually, and in that way enlarging our membership. I doubt if the time has come—although it may come in the near future—when our district membership have shown such a desire for membership in the State Society as to make it safe to open the door thus wide or to make it compulsory.

Now, with reference to the National Association, great emphasis has been placed upon the idea that membership

in that body is extremely limited under the present condition of things. Let me say to you that it is in the power of this society this year to send forty-odd delegates to the national body, and you have had that privilege for years. You may send one for every six of your membership, and yet last year, I understand from the president, but three or four were appointed and attended the meeting at Atlanta.

The year before, with the meeting in our own state, at Buffalo, but five delegates were admitted from our State Society, and but nine from local societies, though at that time delegates were received from local societies—or but fourteen all told, from this great state.

Now, this illustrates, to my mind at least, that there is no very great ambition on the part of our members to become members of the National Association, and it seems to me that we ought to have some evidence of a desire for membership in that association before we open the doors so widely, and find ourselves after all not greatly benefited by the increase sought for. We now have the privilege of sending forty delegates this year to the National Association, and all have the privilege of becoming permanent members if they so desire. Your credentials as a delegate take you into the national body without any question whatever, and that privilege is extended to every state society in the United States. I am in full sympathy with the suggestions of Dr. Jarvie as to the wisdom and value of keeping the National Association a conservative body as regards size. The objection that has always been raised to receiving delegates from local societies is the inability of the National Association to determine the character and standing of such societies. There are hundreds of them. In the case of a man presenting a certificate when that rule was in effect, the association had no way of determining whether he was a legitimate practitioner or whether the society sending him was a legitimate society. The association took the view that any man being a member of his state society, and the society being known,

was eligible so far as his reputability was concerned for membership in the National Association. And so it was for this reason that the present rule was adopted.

Now just a word as regards the apparent lack of interest in the National Association; just one point I would like to speak of, because I think it a vital one, and because it seems to be menacing the growth and influence of that association. I refer to the unintelligent criticism of dental societies. I speak more particularly of the National, although the same rule holds precisely with state societies. It not infrequently occurs in our societies and in our journals that men who seldom attend its meetings will criticize the National Association for its acts of omission and commission, or what not, simply upon hearsay or unintelligent information and knowledge regarding that body. I need not stop to tell you what the National Association is; probably you all know. The point is this: unintelligent criticism of our national and state societies has an influence upon the young practitioner as he comes into the profession. For instance, there is a criticism of some pages, but I will quote only one sentence, in the *Dental Brief* for May, from one of the most highly esteemed and valuable members of the profession in this country—a criticism of our last National meeting, and this gentleman admits that he was not present. Hear this from his closing paragraph: "We need new blood and young blood, and a little chloroform to make way for it if need be." Now, take the average man who does not attend the National meetings and let him read that sentence under the name of the man who uttered it, and what idea would he gain? Certainly not one that would attract his membership, or one that would cause him to travel a thousand miles, more or less, to attend the meetings; and the same thing is true of our state societies.

It seems to me that what we need above all things else as a profession, as an organization, or as a society or association, is that we lay aside all this harsh and unintelligent criticism of one

another or of our associations and what they are trying to do, and stand shoulder to shoulder for advancement and progress. When we do that I am sure our associations, be they large or small, will be effective for the upbuilding of the profession.

Dr. T. P. HYATT, Brooklyn. I would like to say just a few words to the members present. First, I want to assure you that it requires a considerable amount of courage for a young man to get up and address this society. When I hear the criticisms brought against our constitution by one who has been active in the work in every way, and when I hear a few who assert that we should be a little conservative, and still another who takes the ground that there is no enthusiasm to join the National Association, I would like to ask, What are we afraid of? Of being a little too radical? If it would bring out hundreds of young men, placed like myself, who would like to get out and do something where we have never done anything before, I am in favor of injecting a little radicalism into our methods, and if it does not prove beneficial we can go back to the old way. I believe we should give to every man the opportunity to become a member of the local societies, the state societies, and by virtue of that membership he should become a member of the National Association. In this way we will gain many recruits who will, I think, prove of great value and benefit to the association.

Dr. M. L. RHEIN, New York. This discussion has assumed an aspect that is important to the dentists of this society, if not of the nation at large. I had not intended saying anything on the subject until I heard the remarks made by our secretary. While as a general rule I agree with Dr. Butler, I cannot agree with him in all of the deductions he has made. I do not know who wrote the article quoted from the *Dental Brief*, as I did not have the pleasure of reading it, but I would emphasize every word of that quotation, and thoroughly agree with every letter of it, especially that a little chloroform in the National Asso-

ciation would eventually be productive of a real national association, for we have none at the present time. I can sympathize with our dear friend Dr. Jarvie in the position which he took, and with all the love and affection for him that we all have, when he spoke he reminded me of a lawyer pleading for a criminal who was almost self-convicted. He feels it his duty to stand by the child which he has for years helped to create, and my sympathy went out to Dr. Jarvie in the hopeless task which he assumed here this morning. I say hopeless, because I know that I am uttering the sentiments of ninety per cent. or more of the dentists of this country. Neither can I sympathize with the remarks of Dr. Jewell. If there are practitioners of dentistry in the state of New York who may not be up to our standards of ethics or morality, but who evince a disposition to associate with us, it is our duty to extend the professional hand to them, in order to lift them up if possible. I cannot stand idly by without combating such illiberal sentiments as those uttered by Dr. Jewell.

As a member who has been in attendance at the meetings of the National Dental Association as often as I could find it possible, I disagree with the deduction made by Dr. Butler; I cannot believe that the practitioners of New York are men unwilling to become members of the national body—as soon as they realize that there is a national body.

Now, I will present another picture to endeavor to prove my assertion. We heard this morning of the beautiful plan adopted in the Illinois society; we are acquainted with it—we have read about it, as also the glowing account of their membership, of their meetings in Illinois since they adopted this method of conducting the society. I want to tell you, gentlemen, it is the natural trend of evolution toward liberality, toward professionalism as in any other profession, but I want to say that this idea is not original with Illinois. The New York State Medical Society was the first professional association, I believe, to have adopted that method. As a physician in

the state of New York my membership in the New York County Medical Society makes me a member of the New York State Medical Society. This is exactly on the lines illustrated by Dr. Ottolengui, and it has proved a grand success in the New York State Medical Society.

Now turn for a moment to the American Medical Association, to which we must naturally turn in comparison, and what do we see? Do we see a membership comparable with ours? Not at all. Their journal—the *American Medical Association Journal*—has the largest circulation of any medical journal in the world. If I am not mistaken the figures are within a few hundred of fifty thousand that go out every week. I cannot tell the exact membership of the American Medical Association, but at the meeting in Boston there was an attendance of almost five thousand members, and I am sure at the coming meeting at Atlantic City there will be a larger attendance than that.

Such an attendance means a national organization, and that is the only way for us to assume that we can have a national association. This idea of saying we must educate men up to a certain standard to be able to come into such an association is a relic of barbaric days—a relic of illiberal thought, and it is time that the ideas of the present should prevail in this respect.

The reason, in my opinion, why the National Dental Association remains where it is, is because of these barbaric rules. Throw them away, and you will see the same eagerness and desire to make that body as truly a national association as exists today among the physicians at large who have created the present status of the American Medical Association.

Dr. PECK (closing the discussion). It is not necessary that I say very much in closing this discussion; in fact I shall not. The time is short, but I would not have this body of members, this association, go away under the impression that I had any idea of coming to you in my capacity of essayist today as the official representative of the National Dental Association. Such a thought never came

into my mind. I came to you simply as an individual member of the profession—as an humble essayist, and whatever was said in the paper which I read to you was simply an expression of my individual ideas regarding organization and association. A little more than a couple of months in the future I shall have the privilege, I trust, of speaking in an official way of the National Dental Association. However, I have been much pleased with the discussion we have had on the paper, but I shall not attempt to enter into a discussion of that phase of the question at the present time.

The subject was passed, and the President announced as the next order of business the reading of a paper by Dr. I. C. CURTIS, Fulton, N. Y., on "Fifty Years of Dental Science, with Its Fads and Foibles."

[This paper is printed in full at page 1040 of the present issue of the Cosmos.]

Discussion.

Dr. S. G. PERRY, New York city. This paper is interesting as showing mainly what has not found a permanent place in dental practice. In this the writer is consistent, as he evidently did not set out to enumerate and describe what has been permanently accepted. He is not to be criticized, therefore, for having omitted mention of the many great inventions and the indispensable methods of practice that have been accepted as essential to modern dentistry. The essayist has taken a great deal of pains to enumerate, nearly chronologically, the many fads that have been presented to the profession, but at the close of his paper he says that he leaves it to the dentists of the day to separate the wheat from the chaff. This does not open the way for much serious discussion. If he had praised or condemned, there might have been greater incentive for argument. As it is, we can only admire his memory and be thankful for his painstaking search of the literature of our profession.

Dr. Curtis recorded a long list of in-

teresting occurrences, and has given their dates, which may be of great value to the students of our literature. This in itself justifies the paper and gives it value. The essay is a sort of retrospect, and I confess to being startled by the long array of facts that had passed out of my mind. The paper, I think, would have been more complete and satisfactory if the writer had gone farther, and had set opposite the fads and foibles that have been forgotten, the facts and figures of the great improvements that have come to us almost as our inheritance, and which by common consent are permanently incorporated in our profession.

Doubtless Dr. Snow, my colleague in the discussion of the paper, will call attention to some of the prominent milestones that mark the pathway of our development. It is only natural, after all, that in the evolution of a new profession the way should be strewn by the wrecks and ruins of many fads and foibles. They are the natural results of the activities of the professional mind. Gropping in the darkness of the unknown we are on the lookout for new light, and in our eagerness a glimmer here or there seems like the radiance of the great central sun of truth.

We make a new discovery of an old fact, or invent a new way of performing an old operation, and this becomes to us a new center of interest, and exaggerating the importance of our new discovery we bring it before the profession with the confident assurance that we have added something to the sum total of positive knowledge. It is taken up by those who must always have some new thing, and it in turn becomes to them a fad which holds its place until a new shake of the kaleidoscope brings a new aspect of the old fact. In this way a weeding-out process goes on, and year by year, and decade by decade, we come into possession of facts that remain.

It would seem that the man who produces a new fact would be the best judge of its value. The concentration of mind necessary to its discovery would seem to give him authoritative judgment, but

his egotistic bias is likely to be such that only the great jury—the profession—can dispassionately pass the judgment that will be final. The permanent acceptance by the profession of new devices and new methods of practice becomes, after all, only another illustration of the survival of the fittest. A study of the kind presented by this paper shows us what a roundabout course we have taken, and how we have been detained on the way by fads that have been bubbles ready to burst when pricked by the probe of unbiased common sense. There is something of the boy in us all, however, and I am ready to believe that the time will never come when we will not take some pleasure in blowing bubbles. They float as buoyantly as poetic fancies, and charm by their iridescence, and I am not sure but that there is even a subtle surprised delight when they burst! I hope the time will never come when the enthusiastic boys of our profession will not fill the air with bubbles that rise like great expectations, even if they must burst like blasted hopes. But they do not always burst! Floating in the air safe from the probe of time are the twin bubbles, non-cohesive and cohesive gold, each beautiful in its own way. And keeping happy company are the bubbles of anesthesia, the rubber dam, separators, contour fillings, tin foil, gutta-percha, amalgam, oxyphosphate, porcelain and gold inlays, porcelain and gold shell crowns, and last in our thoughts because so familiar, but not least for the comfort and benefit of our patients, porcelain teeth—one of the first achievements of our profession. There is a dim light on the horizon that may prove to be the shining bubble of permanent plastic fillings that shall match the color of the natural teeth. When this long-sought for treasure is found, then indeed will the measure of our usefulness and our happiness be full! And yet not quite full, for we have not yet systematically considered the conditions and the need of those who through poverty suffer and do not complain. We shall never know the profoundest joy that can fill the human heart until we know the bles-

sedness that comes from helping those who need.

Some day, in the cities at least, there will be organized efforts to care for the teeth of the poor. In the long career of medicine and surgery there has been nothing so creditable as the establishment of hospitals and institutions for the care of the poor. Our own career as a profession has been short, but it has added incalculably to the comfort and happiness of the race, though its ministrations have been mainly to the well-to-do and to the rich. Its greatest glory will be reached when it finds a way to give some care to the teeth of the poor. The day will come when men with souls filled with tenderness and compassion will volunteer to give a certain amount of time and free service each year to the poor. The task will not be agreeable to men who are fastidious, as dentists are sure to be, but if the sacrifice be greater, the reward will be more blessed. Then will be better known to all men the true measure of our usefulness.

We shall always have fads and foibles because we are human, but they will only delay, not prevent, the fulfilment of our destiny, which is to be one of the most blessed because one of the most useful callings on earth.

Dr. G. B. SNOW, Buffalo. The paper which Dr. Curtis has given us is, as Dr. Perry has said, mainly a review of the methods which are not at present in use. The factors which now constitute dental science have nearly all been omitted. The paper shows in my estimation a situation something like this: We have a turbid stream flowing into a body of water and mingling with it, and when it gets to the shallow places it flows on, carrying with it the lighter material and leaving the more solid particles to settle to the bottom; that precipitate becomes harder and harder and finally rock. When we get to that stage, we have what constitutes dental science today, while the drift material has passed away. Instead of fifty years, as the essayist says, it is seventy years since the first instance he mentions—that of Dr. Spooner. And here is an instance of how a good thing

is antagonized when it is first introduced. We all know that many of our best things have been received with incredulity and scorn, and afterward have been obliged to fight their own way and show for themselves what they are. This narrative goes back to the time when if one dentist went into the office of another it was regarded as an act of hostile invasion, and the latter did not feel safe in saying anything to the invading party until he had closed his laboratory door and placed his back against it.

The first thing I would mention is the subject of anesthesia. Dr. Horace Wells of Hartford, as you all know, became impressed with the value of nitrous oxid as an anesthetic, and going to Boston he attempted to demonstrate its use before a number of surgeons at Harvard College. They procured for him a patient, a young boy, and during the demonstration that boy did what we often see done now—created a disturbance. These surgeons howled Dr. Wells out of the arena, and as Dr. Holmes said, the advent of anesthesia—that boon to suffering humanity—was delayed for two years.

Then came the amalgam war, when, as the essayist tells you, a number of the members of the American Society of Dental Surgeons were expelled from the society on account of their using amalgam. The society passed a resolution that every member thereof must subscribe to an agreement not to use amalgam, or he would be expelled from the society, and consequently a number of men were expelled. I am happy to say that there was enough professional independence in those days to antagonize such a resolution, and a great many of the members of the society went out. The upshot of the matter was that the ship of the American Society of Dental Surgeons went to pieces on the rock of amalgam, while today this material is one of the most valuable agencies we have for the preservation of the teeth.

Then comes gold. The essayist ascribes the discovery of cohesive gold to Dr. Westcott, and says that he went to Baltimore in 1847 and lectured on the

subject before the students of Baltimore. Then came Dr. Arthur, one of the first graduates of the Philadelphia College of Dental Surgery. After he started into practice he had in his office a student who is now well known to the profession as Dr. Louis Jack. Dr. Jack was put in the laboratory to make some experiments in filling teeth with gold. At that time Watts' crystal gold was well known to the profession and Dr. Arthur was using it. Dr. Jack was given some old scraps of foil that had lain around so long that Dr. Arthur thought they were useless, and he advised Dr. Jack to anneal them. The latter found that the gold when annealed worked just as well as the crystal gold, and from that time on Dr. Arthur used annealed foil and advocated its use to the profession. Today Dr. Arthur is better known to the profession as originating this method than Dr. Westcott. That is another instance which shows a method that was used and forgotten, and re-discovered and introduced as new—from which time cohesive gold has been one of our most valued agencies for the saving of teeth.

The essayist mentions that in 1866 the flexible edge for vulcanite plates was introduced. This is another process that has been invented and re-invented several times. Now, what is the reason for that? It is because the treatment of soft and hard rubber is different. The former requires a low heat for a short time, and the latter a high heat for a longer time. When the flexible rubber is used at first it is all right, but in a little time it becomes brittle and is of no use. That is why it has been used and forgotten, and the reason why I regard the flexible edge for vulcanite plates as absolutely worthless.

Dr. Bonwill is mentioned in this paper simply in connection with a crown which has become obsolete. His services to the dental profession in the matter of articulating artificial teeth have received no mention whatever. However, Dr. Bonwill was not the first man who invented the anatomical articulator. This was done by Dr. Thomas W. Evans of Philadelphia, as far back as 1840, and

so it has taken sixty years for this idea to get as far as it has done in the minds of the profession. The first articulator had horizontal slides to provide for the lateral movement, as did Dr. Bonwill's articulator. The latter spent much time on the subject of articulation, writing extensively in order to attract the attention of the dental profession to the matter.

In 1889, Dr. Richmond S. Hayes of East Bloomfield, N. Y., invented and patented an articulator which imitated the condyle movements more nearly than did that of Dr. Bonwill, by making the movement an inclined one—forward and downward. He died soon after the articulator was invented, and consequently it never came into use.

Then came Dr. W. E. Walker of New Orleans, who went a step farther than Dr. Hayes, by showing that the condyle movement was not only inclined but that the inclination varied in different individuals, and even in the two sides of the same jaw. Therefore he invented an articulator, which was patented in 1896, which had adjustable joints so that the condyle movements of the patient could be imitated. He also invented an instrument which he called a "facial clinometer" for ascertaining the condyle movements. He was able to demonstrate that if a full denture were set up with a flat articulation, so that the cusps would all touch a flat surface like that of a table, the person who wore it would only be able to make the teeth meet upon one side if the mandible were moved laterally, and as a consequence such dentures would not be well retained in the mouth until after the wearer had learned to use only a straight up-and-down motion in mastication.

Prof. Carl Christensen of Denmark produced an articulator about 1901, which much resembles Dr. Walker's. He also devised a simple and easy method of ascertaining the inclination of the condyle paths and of adjusting the articulator joints to imitate them, and thus completed the solution of the problem of articulation. An article from his pen was published in the *Cosmos* for October 1905, and is well worth reading.

This subject, then, has been under discussion for about sixty-seven years, and has just reached the point where it is practical for the dentist. Just think where we are today in articulating teeth! —I suppose a great number of dentists cannot use the anatomical articulator, but use nothing but the old-fashioned one. In using the older articulator it is impossible to place the casts near enough to the joints, consequently we have to guess at their position in setting them. Then, too, the arrangement of the teeth afterward is such that it is guess-work altogether. If we attempt to imitate the compensating curve, it will be mostly guess-work, and later, after the plate is inserted, it will again be a matter of guess-work as to whether the plate will serve its purpose or not! I venture to say that not one-half of the colleges today use the anatomical articulator. Looking at the list of articles prescribed for the students you will only see a plain-line articulator, and I venture to say that half of the graduates go out into practice with no idea as to how to set up a full upper and lower set of teeth correctly articulated.

This is a very momentous subject to the profession, and one in which there is a great field for thought and work. We go on perpetuating our old blunders without any attempt at correcting them.

Dr. CURTIS (closing the discussion). I wish to thank Drs. Snow and Perry for the ease with which they have let me down. Dr. Snow seems to have the idea that many of the fads which proved to be valuable were not mentioned in the paper. That is true, but I did this with the impression that the good things were picked and retained by the profession. I did not attempt to mention all of the fads that were laid aside, or all of the good things that were retained; I merely wished to show to the members present what was the consensus of opinion of good members of the profession at the time, or before the time, that I entered practice. To have gone over the records of all the fads and inventions of the profession would have required more time than I was entitled to for the paper.

I wish to correct one impression which seems to me important, namely, that the percentage of sulfur in rubber should regulate the length of time and temperature of vulcanization. Sulfur in varying proportions regulates the hardness of the rubber, which is not necessarily modified by the degree of heat in the retort. A rubber was placed on the market which even when vulcanized in the same way as plate rubber would still remain flexible.

The object of the paper was more to record matters of history, and history consists mainly in the recording of cold facts. It may be that Josephus, Gibbon, Guizot, and Bancroft found it unpleasant to record some of the historical facts which they did record, but in matters of history it is important that the truth be told.

The next order of business was the report of the chairman of the Committee on Fellowship Medals, Dr. WM. JARVIE, as follows:

REPORT OF COMMITTEE ON FELLOWSHIP MEDALS.

ALBANY, N. Y., May 10, 1907.

TO THE DENTAL SOCIETY OF THE STATE OF NEW YORK.

Gentlemen,—Your Committee on Nominating Fellows would respectfully report that they unanimously recommend that Dr. Truman W. Brophy of Chicago be elected a Fellow of the society, and be awarded the medal provided for by the William Jarvie Gold Medal Fund.

Dr. Brophy has been prominently connected with the dental profession as an instructor and oral surgeon for many years. His operation for the relief of cleft palate is well known throughout the world, and his services are frequently called for in different parts of the country. By it many who would otherwise be condemned to discomfort and deformity through life are restored to a normal condition and comfort.

The term of Dr. S. G. Perry as a member of the committee will terminate at the close of this meeting, and it will be the duty of the president to fill the vacancy for the term of five years.

Accompanying the report is a bill of Tiffany & Co., for fifty dollars for the medal of this year, and a bill of a similar amount for one of those given last year. The money to pay these bills is in the hands of the treasurer as the income from the medal fund.

S. G. PERRY,
A. R. COOKE,
R. OTTOLENGUI,
WILLIAM JARVIE, *Chairman,*
Committee.

(Dr. Hofheinz was absent.)

The following letter had been received from Prof. W. D. Miller, in acknowledgment of the Fellowship medal awarded him last year by the society:

BERLIN, April 8, 1907.

Dear Dr. Butler,—I received a few days ago the Jarvie gold medal awarded to me at the last meeting of the Dental Society of the State of New York for "scientific research and advancement of the dental profession." I beg you to express my heartiest thanks to the society for the distinction which it has thereby conferred upon me, and for the great pleasure and satisfaction which I derived in the knowledge of the fact that "it symbolizes the esteem in which I am held by my professional brothers in the Dental Society of the State of New York."

It would be exercising unjust criticism upon the judgment of the members of the Dental Society of the State of New York if I were to doubt my worthiness to be the recipient of the medal, which otherwise I would be inclined to do. The possession of the medal and the knowledge of the motives which prompted you to confer it upon me will always be an incentive to me to do all in my power for the advancement of the interests of our profession and to justify the action of your society.

With cordial wishes,

Very sincerely yours,

W. D. MILLER.

Dr. HILLYER moved the adoption of the report and the adoption of the recommendation that Professor Brophy be made a Fellow of the society.

The motion was carried.

Motion was then made and carried to adjourn until 2 o'clock.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

THE thirty-ninth annual meeting of the Pennsylvania State Dental Society was held in the assembly room of the Schenley Hotel, Pittsburgh, July 9, 10, and 11, 1907.

TUESDAY—Morning Session.

The first session was called to order by the president, Dr. J. T. Lippincott, Philadelphia, on Tuesday morning, July 9th, at 10 o'clock.

The meeting was opened with prayer by the Rev. J. W. G. Fast, Pittsburgh.

Dr. J. A. Libbey, Pittsburgh, welcomed the society to Pittsburgh in a short address, which was responded to, on behalf of the society, by Dr. H. N. Young, Wilkes-Barre.

The reading of the minutes was dispensed with, and motion was made and carried that the minutes be approved as published in the printed proceedings.

The vice-president, Dr. P. K. Filbert, Pottsville, was invited to the chair, while the president, Dr. J. T. LIPPINCOTT, read his annual address, as follows:

PRESIDENT'S ADDRESS.

Fellow Members and Guests,—It is a pleasure to address you on this the thirty-ninth annual meeting of the Pennsylvania State Dental Society, to express a few thoughts and make some suggestions, which though perhaps neither new nor original, have seemed to me pertinent.

First, I desire to take this opportunity to publicly express my appreciation of the arduous labors of the various committees who have worked so faithfully to make this meeting a success. To them primarily are we indebted, as well as

to the several essayists and clinicians who have prepared this tempting intellectual feast to which we now bid you welcome.

It is with profound regret that I announce to you the loss to this society during the past year, by death, of one of its most active members, Dr. H. Ralston Swing. I suggest that a committee be appointed to present to this body appropriate resolutions on his death.

At the time of our meeting one year ago in Philadelphia, through the courtesy and efforts of two of our members, there was placed on exhibition, in a room adjoining the meeting-room at the Bellevue-Stratford Hotel, an extremely interesting and instructive historical collection, which was visited and examined with interest by the members and guests of the society, and which I am sure added greatly to their enjoyment of the meeting. Through an oversight on the part of your then newly elected president no action was taken by the society in recognition of the work of the men who were instrumental in making that exhibit. I therefore recommend that the society at this time take such action as will properly show its appreciation of their efforts.

In a paper read before the Connecticut State Dental Society, Dr. Nyman calls attention to the close relation between dentistry and medicine, and because he has so well expressed it I quote his language: "The trend of events shows clearly that an affiliation of medicine and dentistry is being established by the slow but absolutely certain process of evolution, despite the scattered opposition of a certain number of individuals. More and more extensively and thoroughly are the fundamental branches of medicine being taught in

the dental schools, and more medical branches added to their curriculum, and more attention is being devoted to dental pathology in the medical schools. . . . Already has the medical profession recognized this close relation by the establishment of the Section of Stomatology in the American Medical Association, and the Section of Dental Surgery in the British Medical Association. Our profession would do well to foster this spirit of closer association; . . . much mutual benefit to both professions will result therefrom."

The fact that dentistry is a branch of medicine, and as such is entitled to serious consideration, seems to have been overlooked by that class of usually bright, intelligent men who act as reporters for our daily papers. How often, at the time of our meetings, do we see a ridiculously garbled report intended to be amusing, and introduced by prominent headlines, caricaturing our profession! This certainly is not in accord with the dignity pertaining to a branch of the healing art, and is not inclined to inspire in the minds of the laity a proper regard for our calling. Why should not this society appoint a Press Committee, whose duty it shall be to personally interview the managing editors of our prominent daily papers over the state and arrange for a proper and dignified report of our proceedings? I am sure those editors would receive such a committee courteously, and if properly approached would gladly comply with such a reasonable request.

The dental examining boards of this and other states have been the target for some merited and much unmerited criticism from the profession, at times from sources from which it would be least expected.

From an experience of several years as a member of the Board of Dental Examiners of this state, it has appeared to me that there is a lack of sympathy on the part of the profession with the board in its conscientious efforts to do its duty.

I would like to impress on the mind of each member of this society that he is, in a measure, personally responsible for the appointment of each member of that

board. It is not a self-constituted body; each man is appointed to that office by the sanction and only on the recommendation of this society; and it is therefore the duty of each member to uphold and so far as in his power lies to strengthen the hands of the board, which is earnestly endeavoring, frequently at much personal sacrifice, to perform its unsought duty to the public and the profession by maintaining the high standard of that profession in this commonwealth.

While I recognize that the year's work of the board is incomplete at the time of the meeting of this society, and that its duties are most arduous immediately preceding this meeting, yet I feel that a short report of work accomplished during the preceding year would be acceptable to this body, and would have the effect of awakening a more sympathetic interest and appreciation of the work the board is doing.

It is with especial pleasure that I announce to you the success of the Legislative Committee, appointed at our last meeting, in having had passed by the recent legislature a new act regulating the practice of dentistry in this commonwealth, which was signed by the governor and became a law on the 7th of May. Through the courtesy of the Dental Council a copy of this law is being mailed to each practitioner in the state.

A detailed report of the act will be given you by the chairman of the Legislative Committee, to whose untiring efforts we are indebted for the success of this much-needed legislation. I trust you will give his report the careful attention and consideration it merits.

I can conceive of no more important work that this society should undertake during the coming year than the careful, considerate, conservative, and thorough enforcement of this law. The endeavor of the committee has been to draft a law on broad, liberal lines, as they conceived to be the desire of the society, to meet not only the requirements of today but of the years to come, to maintain the high standard of the profession in this state, and to protect an unsuspecting public from the snares of charlatans and

quacks masquerading in the guise of practitioners of dentistry.

With the qualified legal practitioner who resorts to advertising, and so steps down from the rank of a professional man and makes of his work a trade or business, we have no controversy; it is his privilege if he chooses to make of himself a professional exile. But the man who without the necessary knowledge and qualifications, frequently without any dental knowledge at all, but employing unqualified practitioners to aid him, whose sole object is to extract from the poor and needy their hard-earned dollars without giving an adequate return in skill and service—he is the barnacle, the leech on the profession whom we desire to eradicate for the good of humanity.

The law provides that "All fines recovered under this act from convictions resulting from information instituted at the instance of the Pennsylvania State Dental Society shall be paid to the said society." While this should eventually provide a fund for future prosecutions, still a large amount of work must be done and funds will be required for obtaining evidence, for attorneys' fees in prosecuting cases, and before any fines are recovered under the act. I therefore recommend—

First, that the Council choose a careful, conservative, broad-minded man of sound judgment and experience as chairman of the Committee on Enforcement of Law, who can and will undertake this work and carry it out in a purely professional spirit in accord with the intent of the law.

Second, that a committee be appointed to raise by subscription the sum of five hundred dollars, to be added to a like sum to be appropriated from the revenues of this society, making a fund of one thousand dollars to be placed at the disposal of that committee for the prosecution of the work.

Third, that the fines recovered as a result of these prosecutions shall also be placed at the disposal of this committee for the further prosecution of the work; provided, that the chairman of that committee shall from the funds thus provided

receive such compensation as the Council may in their judgment deem just.

A recent writer makes the following statement: It was not until man "began to associate and co-operate with his fellow man" that "the possibilities of life came to be apparent, and by concerted effort were transmuted into the tangible utilities and comforts of life. The value of association and co-operation is as great as ever it was, and as productive of benefit to both the individual and to society."

The truth of this statement has never been more fully exemplified than in the history of our profession, particularly in this country in the past sixty-seven years.

One need only note the conditions which existed and under which our predecessors labored prior to the year 1840, when Horace Hayden became the first president of the first dental society organized in America. Then every man's hand was, figuratively, against his brother, and each man zealously guarded from his neighbor his special methods of work and the instruments and appliances on which he depended for his success.

Dr. Merritt, in his recollections of that period, states that "It was almost impossible to obtain any knowledge of professional matters; one had to pay very dearly for any information. No dentist with any reputation would allow another to see him operate, or let him get a peep into his laboratory, fearing that some of his cherished secrets would be stolen. Each man was a law unto himself, and pursued his own independent course, devising his own methods and practicing according to his own knowledge, with no ethical code to restrain him."

Compare that graphic picture with the conditions presented today, when it is the delight of every practitioner who has, or thinks he has, a new appliance or a new method to show it to all of his fellow practitioners who may care to see it or hear it explained at a public clinic, and when no state or territory is without its society meeting at least once a year, at which these clinics form one of the most attractive features, with district and

county societies in all the thickly settled communities, and local societies in all of the larger cities.

Without wishing to minimize the influence of dental colleges, alumni societies, fraternities, and all the other factors which have been instrumental in bringing about this radical change—for these are all phases of that effort at co-operation and association previously spoken of; yet the dental society, as such, stands out as the prime factor in this evolution from the individualism of sixty years ago to the professionalism of today.

Dr. H. E. ROBERTS moved that a committee of three be appointed by the chair to consider the President's address and present a report thereon to the society, and that the hearing of this report be made a special order of business for 10 o'clock Wednesday morning.

Motion carried, and the chair appointed the following as the Committee on the President's Address: Drs. H. E. Roberts, J. A. Libbey, and H. S. Seip.

The President resumed the chair, and announced that the next order of business would be reports from officers and committees.

The next order of business was the report of the Legislative Committee, which was presented by the chairman, Dr. F. D. Gardiner, Philadelphia.

Motion was then made and carried to adjourn until 2 P.M.

TUESDAY—*Afternoon Session.*

The meeting was called to order at 2 o'clock by the president, Dr. Lippincott.

The first order of business was the reading of the report of the Council by Dr. Weaver, secretary.

The next order of business as announced by the Executive Committee was the reading of a paper by Dr. J. CLARENCE SALVAS, Philadelphia, on "Traumatic Lesions Incident to Crowns and Bridges."

[This paper is printed in full at page 1046 of the present issue of the COSMOS.]

Discussion.

Dr. C. V. KRATZER, Reading. I may say in the beginning that my experience with the subject of the essayist's paper is somewhat limited. I had a patient a short time ago for whom I inserted a bridge extending from the first bicuspid to the second molar, in which I carried the teeth down so that they would embed themselves into the gum tissue. I had formerly been in the habit of following this method, so as to produce a natural appearance—the appearance that we all wish in bridge work, as though the teeth were growing out of the gum. Now, unfortunately, in this case, in about two years' time the presence of the porcelain facings produced in the gum tissue a very aggravated form of hypertrophy, so much so that it caused the gum tissues to extend to a point almost even with the gold cusps. The patient telephoned to me that she was suffering great pain and wanted to know what to do. I had her come to my office, and upon examination I found the tissues so inflamed that I was almost unable to touch them with instruments. The first treatment consisted in applying iodine to the gums, which gave, of course, only partial relief. She insisted that I should remove the bridge, which under the circumstances would have been impossible without the administration of a general anesthetic. At a future sitting the conditions had somewhat improved. I then applied glycerol of tannin every day for about a week, at which time the inflammation had subsided and the hypertrophy had decreased considerably; and ever since—for a period covering perhaps three months—the patient has been entirely comfortable. But the ends of these teeth are still embedded in the gum tissue, and of course there is a likelihood of the trouble returning at almost any time, in which case it may be relieved, I think, as in the first instance. That experience taught me a lesson, and I have been careful ever since to have the artificial teeth not quite touch the gum tissue. I have had other cases of that kind in the maxilla in which the effect was disastrous to the extent of

causing great discomfort to the patient. The appearance is of course more beautiful when the facings are in close contact with the gum, but even in these cases I have been careful not to have the teeth press too hard against the gum.

I had a case last week in which a gold crown on a lower bicuspid extended too far below the gingival border, in fact to the alveolar edge. The crown had been inserted perhaps six months before, and the patient informed me that for upwards of a week after it had been adjusted to place she suffered much pain. The dentist assured her that the trouble would subside, and after a week's time it did so, and she was comfortable for six months afterward, at which time she came to see me. I endeavored to remove the crown, but found that I was unable to reach its end by the use of a crown-slitter. I persisted in my endeavor, however, and succeeded in removing the crown without slitting it, an operation which was of course accompanied with excruciating pain. I applied iodine in that case for two or three days afterward, and since then she has been comparatively comfortable. I supposed at the time that I should have to take out the root on account of some trouble in the root-filling, but fortunately it was confined to the crown, and after its removal the patient was comfortable.

Dr. H. C. REGISTER, Philadelphia. The subject which Dr. Salvas has presented to us is one of the greatest importance to the dentist. The title of the paper would have been more appropriate if it had been worded, Traumatic and Toxic Lesions Incident to Crowns and Bridges, rather than confining it to traumatic lesions alone. A traumatic condition, whether it comes from a ferrule or from a deposition of calcic matter upon the roots, is invariably associated with toxic influences. They go hand in hand.

The teeth, being end-organs, under certain conditions are the last to receive the required nutritional supply, and unless they receive it in full they will cease to be useful organs. Now, we will have to rid our minds of the idea that there is

such a thing as dental pathology. The general underlying principles of the pathology of the mouth are the same as those of the pathology of any other region of the body. The influences responsible for the development of oral diseases, as Dr. Salvas has very correctly told you, are ever present in the mouth. The mouth, as we all know, is an incubator of the most perfect type for the growth of bacteria. Pathogenic bacteria are always present in the mouth. There are two or three groups of bacteria—the staphylococci, the streptococci, and the pneumococci—that constantly inhabit the mouth, particularly the first two groups, which become very virulent in the presence of insufficient vital resistance. The sooner we bring ourselves to understand that our efforts in the matter of practicing dentistry resolve themselves into a continual war against the impressions produced by an abnormal environment, which is constantly present, the greater will be our success in treatment, and if we keep that truth in mind we will have an ever-helpful ally in nature through the white blood corpuscles. They are the scavengers of the body, and when we lend them a hand they will aid us in overcoming disease conditions and restoring health. Dr. Salvas has said that we are constantly using mechanical means in the way of ferrules, the Richmond crown, etc., and creating diseases that should never exist. Then again we are adding to the trouble by using large masses of zinc oxyphosphate for retaining these crowns. This oxyphosphate is extremely porous, and will harbor bacteria at the cervical border of the crowns. Now, if bacteria be present in the mouth and create a focus of disease, through the use of imperfect artificial substitutes, our efforts should be directed first of all to the study of the principles involved in this work in order to prevent all possibility of inducing dental and oral diseases through our endeavor to supply the lost organs, often regardless of the pathologic conditions to which they may give rise.

Dr. SALVAS (closing the discussion). My idea in presenting the paper in the beginning was to point out the fact that

our studies and investigations should not be altogether confined to a study of the principles of mechanics. We are and have been in a large measure, as I said, studying and experimenting with various mechanical appliances without giving any due regard to their relation to the soft tissues. I then endeavored to emphasize the erroneousness of this assumption by pointing out the serious consequences resulting from suppurative diseases of the pericemental membrane and the contiguous tissues, and furthermore that these diseases were largely due to the presence of mechanical contrivances. I went further, and stated that the object of the paper was to suggest methods that would obviate entirely all sources of mechanical irritation.

The next order of business as announced by the President was the reading of a paper by Dr. G. W. Cook, Chicago, Ill., on "The Degeneration of Tissue, with Special Reference to the Oral Mucous Membrane."

[This paper is printed in full at page 1025 of the present issue of the Cosmos.]

Discussion.

Dr. I. N. BROOMELL, Philadelphia. I was at a loss, when I read the title of Dr. Cook's paper, to understand just what the essayist meant by degeneracy of the oral mucous membrane. My first thought was that he meant general degeneracy, such as takes place with the approach of old age. My next thought was that he meant local lesions, and that is evidently what he did mean. Dr. Cook speaks of the infiltration into the tissue. This brings to my mind the question of where these lesions begin; whether they begin—and I am now speaking specifically of the mouth—in the deeper structures in all cases, or whether in some cases they begin superficially, and afterward involve the deeper structures. In the epithelium we of course have a non-vascular tissue, and in that tissue it seems to me almost impossible for any active, destructive agents to begin their work.

Dr. Cook has spoken of the question of mouth-washes, and I wish he had gone

more deeply into the subject of their effect upon the soft tissues. It seems to me that if we use them and expect to bring about a favorable result, they should be kept in contact with the tissues for some considerable length of time. The idea of simply rinsing the mouth and throwing out the wash almost immediately, it seems to me cannot bring about any remedial effect in the more deeply lying structures.

As I said in the beginning, it is simply impossible for me to discuss a paper on pathology, but I want to take this opportunity to congratulate Dr. Cook on the very valuable paper he has presented to us.

Dr. O. L. HERTIG, Pittsburg. Dr. Cook's paper is evidently the result of considerable study and observation. Degeneration to my mind is a normal process, when we take into consideration the fact that old age comes to all of us; but scientists for years have been trying to discover some means of combating that form of degeneration which takes place in the mouths of youthful people. How often have you seen in the mouths of such patients—those with bright-looking faces and who to all external appearances are in perfect health—all the evidences of premature degeneration. Now, what is the cause of all this? Dr. Cook has gone very exhaustively into the microscopical study of this subject, and of course it takes years to properly elucidate it from that standpoint; but I, in my rôle of general practitioner, have been able to make some observations and have some few theories to advance in regard to the causes of this type of senile degeneration in young people. To my mind there are two kinds of causes, local and systemic, and among the former might be mentioned irritation, as cited by Dr. Cook, and among the more potent causes, lack of irritation, as not cited by Dr. Cook. What I mean by the lack of irritation is an improper or insufficient performance of normal function in the oral cavity. I contend that more cases of irritation of the mucous membrane originate from lack of or improper performance of normal function of these organs than from

any type of mechanical or chemical irritation. I do not dispute the fact that the tooth-brush improperly used may cause certain degenerative phenomena, nor do I contend that mouth-washes may not in some instances cause the same phenomena, but so far as I am able to judge, the lack of care of the teeth, unhygienic surroundings, and insufficient functional activity are the most potent causes of the degenerations which I have seen. Lack of use, disuse, and over-use, in my opinion, will cause practically the same processes.

With regard to the systemic causes, Dr. Cook is going into a field of investigation that is entirely too deep for me. In his investigations he is striking at the root of these systemic causes. Many of us have oftentimes gone into the woods and admired a large, stately oak towering above the rest of the trees in its magnificence and grandeur, apparently sound in every particular, but near the topmost portion of the tree we have seen a branch, limb, or twig that was dead, and that far beyond the possibility of a passing stone or accident of any kind, our only conclusion being that it must have been caused by the worm at the root of the tree. Now, we may liken this tree to the system, the twig representing the extreme limit of the circulatory system where the blood is carried less abundantly, and these extreme branches of the system are affected by the worm at the root. Although these cases may be less frequent, they, however, show that systemic causes may produce the same type of tissue degeneration as is induced by local causes.

Dr. Cook suggests that these effects may be caused by certain mouth-washes. I fail to see that a mouth-wash that would not check fermentation would have any effect as an astringent in the mouth. The use of mouth-washes is so transient that I fail to see where a judicious use of them could produce this trouble.

I wish to compliment Dr. Cook on his valuable paper, and I am glad to have been called upon to discuss it.

Dr. Cook (closing the discussion). Dr. Broomell, to my mind, touched upon

one of the most important phases of the subject, viz, whether these degenerative changes start in the epithelial structure or in the submucosa. There are only a few factors, perhaps, that will produce degeneration of the epithelial cells in the sense of starting a lesion on the surface rather than deeper in the structure. I alluded to some little experience upon that point in the paper, and stated that it was the use of astringents, to my mind, that produced the greatest or highest type of degeneracy of the epithelial structure, in the form of a local lesion or a local phase of degeneracy.

In the discussion of bridge work carried on today, one of the speakers reported a case in which he set the teeth firmly on the gum tissue, and as the result hypertrophy began and progressed to a considerable degree. This pathologic result is somewhat the same as would be produced, in a measure, by the use of astringents. By their use you close up the orifices of the mucous follicles, and in the case illustrated the same thing was produced mechanically, by holding in contact with the mucous tissues a mechanical contrivance, thus interfering with all the chemical and physical processes that go on in the tissues. There is one thing that I have noticed in the observations I have made, and that is that you cannot possibly close up these mucous follicles, or hold in contact with the mucous membrane anywhere in the mouth or in any portion of the body a foreign substance for any great length of time without degenerative processes ensuing. First of all the pressure closes up the orifices of the mucous follicles and interferes with the normal functions of the gland tissue as carried on in the healthy individual. Whenever we interfere with functional activity we have degeneracy of the tissue in one form or another. It may assume, as cited in the paper, the colloid or mucoid types of degeneration. These four phases of pathology can be produced artificially. I have frequently produced them in mouths in cases of bridge work, and in these cases there is degeneration, as I said in the paper, which may be of one particular

form, or perhaps several forms may exist in one single case. The important phenomenon that seems to be constantly going on in this pathological mucous membrane is that a certain amount of substances is carried there by the blood to the submucous structure, and forced along through osmotic forces into the mucous follicles, and then thrown off. Now, if the process of elimination is interfered with, degeneration will result.

The last speaker referred to disuse of the tissues, which is one of the most important factors to be considered in this connection. The following is a crude but accurate illustration of the point in question. Perhaps many of you have gone barefooted when you were boys, and can remember how hard the epithelium would become on the soles of your feet—so hard, in fact, that you could not stick a thorn through it, if you went barefooted long enough. You can develop certain conditions which will produce certain tissues and certain tissue degenerations, but when you wear shoes continually you know you can hardly walk across the floor in your bare feet, because of the tissues being so tender.

The study of this subject is an evolutionary process. You cannot pick up a thing and say that you see so and so; it has to be studied in all its phases before you can arrive at any conclusions. The whole subject is a biological one. Other phases that you see produced in the vegetable or animal kingdom may have some influence, and the lack of use, or rather the disuse, is probably one of the greatest causes of degeneracy. What imbeciles we all would be did we not use our brains at all; how little the brain would be developed! Sometimes it fails to develop through certain atrophic influences in childhood, and when this happens it is a form of degeneracy in all portions of the body, and this is one of the systemic causes that the last speaker mentioned. The illustration of the dead twig at the top of the tree is a good one, but the worm may be in that limb, instead of in the root of the tree—we cannot tell. It was said that the worm at the root may produce disturbances at the top of the

tree; that is true, but after all it is an external influence. All plant and animal life would be normal if it did not have anything to bother it. Somebody has said that if you isolate a tooth and keep it clean in the mouth it would never decay. Of course it could not decay, but other things would happen to it. Degeneration of the tissues would take place and it would drop out. So we have to give these tissues a certain amount of protection from microbes, and the point that has been most vividly illustrated to me is the point mentioned by both of the previous speakers—that of the use of mouth-washes. Now, we all know that it is easy enough to find a mouth-wash that will kill the microbes in the mouth, but if you undertake to do it you will find that the epithelial structure will degenerate long before the microbes die.

The point I wish to make is this: All antiseptics act mechanically, and it is not advisable to employ astringent or irritating agents that are liable to bring about certain of these degenerative changes. I have never been able to bring about degeneration by means of bristles or tooth-brushes, but in the mouths of seventeen dogs which I kept under observation for about twenty-two months, in which were used antiseptic solutions twice a day, morning and night, we observed tissue changes that I have been able to study. Of course you will say that the dog differs from man. That is true. He has not the same intelligence or ability to express himself, but the tissues are not so very different. His mode of living is different, because his natural outdoor environment is very different; but the dog's tissue degenerates more rapidly under changed environment than does that of man. In every form of plant and animal life there is apparently a tendency against adapting itself so readily to artificial environments as with man, and therefore this is one reason why we can wear all sorts of mechanical contrivances without the tissues becoming completely destroyed and without the function of the oral cavity becoming entirely lost.

This is the reason why the tissues can adapt themselves to these conditions, but

they do not always do so.' The object of writing this paper was to follow out a line of work that I started some time ago, viz, to find out if possible some of the causes leading to the accumulation of bacteria in certain localities of tooth-structure, with the resultant changes.

These colloidal or gelatinous substances, as stated in the paper, will collect upon the teeth, and may be found in abundant quantity by scraping them. We find this sometimes in the absence of decay, and sometimes in the cleanest of mouths. Wherever we find it under such conditions it is invariably in connection with some inherent resistance of the tissue. There is formed in such mouths some substance that is detrimental to the action of the bacteria themselves. I am not as afraid of bacteria as are some people. They are very harmful under conditions of diminished vital resistance, but if the body be kept in a normal condition the bacteria do not have much opportunity to produce disease. Healthy tissue has always a sufficient degree of vital resistance to take care of itself. Every cell, no matter whether it be high or low in the scale of development, has an inherent predisposition to preserve itself. Self-preservation is the first law of nature. It is one of the characteristics of all living substances, and degeneracy of these tissues is only brought about by disuse, too much use, or some form of mechanical irritation.

There is one phase of the subject of disuse that I would like to touch upon, and that occurs in those individuals with normal teeth and normal gum tissues, who are in the habit of chewing on one side of the mouth. In the majority of these cases we find that the tissues and the conditions are more normal on that side than on the other, and often on the side of disuse, or where the use has not been normal, you will find the gingival interproximal spaces filled out to the point of contact in many cases, even in those in which the mouth is kept in a hygienic condition. The gum tissue in these cases will sometimes grow to the contact point, and may constitute a well-defined form of colloidal degeneration.

[VOL. XLIX.—78]

If a person whose mouth has not been subjected to the required degree of functional activity should become ill, say with typhoid fever or some other disease of protracted course, you will notice that when he recovers, or usually soon after recovery, the teeth begin to decay in the interproximal spaces and at the points of contact. If you will observe these teeth closely you will find the so-called gelatinous plaques, which by the way are very difficult to find; only within the last year have I felt that the statement of Dr. Black in regard to those plaques was anything like correct. But today I believe that they do exist in some cases, and that they are constituted by the colloidal substance of which I spoke in the paper, because of its tendency to form on the enamel of the teeth. These teeth, from disuse, will begin to decay almost immediately after the individual leaves his bed.

Some eleven years ago I spent half my time in a hospital in which all kinds of diseases were treated, and became more or less of a nuisance around the institution, because I persisted in collecting as many cultures as possible in cases of typhoid fever, and in my observations and studies of these cases and cultures from many other diseases of like character, I found that in these diseases we were most likely to find pathological lesions in the mouth as the result of disuse.

An interesting fact was also noticed in connection with teeth that have artificial crowns, viz, that after an illness of some duration, and frequently during pregnancy, the gum tissue will roll up around the crown, and if the tissue be cut off, the epithelial structure of the excised margin will exhibit a tendency to grow down and over the crown because of some forces underlying this superficial structure that seem to have a tendency to draw the tissues down more; and if viewed under the microscope, it will be found that the normal cells around that margin have assumed a different form. They have deviated from the physiological cell. This is the point I specially thought of speaking about in connection with the discussion of tissue disuse.

There is another point that I might mention here which was omitted in the paper with the thought that probably it would be brought out in the discussion, and that is with reference to the hard portions of plates coming into contact or being forced into contact with the mucous membrane. The study of vulcanite plates and their effect upon the mucous membrane has been a field of great interest to me. We hear so many statements made about the toleration of the tissue—that it tolerates metal better than rubber, etc., which is all easily explained in a way, but there is something fundamental back of it. In an individual who has never worn an artificial plate the absorption will go on normally after the extraction of the teeth, and it is a very different process from that in mouths where plates have been worn.

I once submitted to one of our best pathologists specimens obtained at post-mortem examinations of individuals who had died during alveolar and gum tissue absorption, asking him for a diagnosis. He looked at a specimen for a few minutes and said, "Well, I do not know what disease it is." I then asked him what it looked to him most like. "Well," he said, "it looks more like carcinoma than anything else." Of course it was not carcinoma, but there was a change in the structure of the cells which, unless one were thoroughly familiar with it, might be diagnosed as carcinoma. Such specimens, if sent to a pathologist for diagnosis, might result in an operation being advised, on the ground that the tissue was affected with a disease closely resembling carcinoma.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, New London, Conn., April 16 and 17, 1907.

(Continued from page 961.)

TUESDAY—*Afternoon Session.*

(Continued.)

THE President announced as the next order of business the reading of a paper on "Hygiene Maintained During the Progress of Orthodontia," By Dr. H. C. FERRIS, Brooklyn, N. Y.

[This paper is printed in full at page 943 of the September issue of the COSMOS.]

Discussion.

Dr. E. S. GAYLORD, New Haven. As the essayist has given us the scientific reasons for the necessity of hygiene in the course of regulating operations, it would remain for me to say but a word in reference to the practical application of his suggestions. That phase of the

subject comes within the realm of that with which I am somewhat familiar, and I am very glad to stand before you and assert that I know of no means in dental practice that is so conducive to great results as is prophylaxis—and when I say prophylaxis I mean all that is implied in the word, and not half-way treatment. The great trouble with operators in the first place is the fact that they are too busy to practice prophylaxis, consequently it is not carried out in the thorough and conscientious manner in which it should be done. To the contrary it is done in a kind of haphazard way—mostly with the aid of the engine. While I do not mean to say that good results cannot be obtained by the employment of the engine, I do say that the best results cannot be obtained by its exclusive use.

Now, if we will take the position that our time and our skill are of some value, and impress our patients with that fact, we will then treat our cases in the manner which shall be creditable to us, because we will give our time for the proper remuneration. And there lies the reason why our services in this connection are rendered in a haphazard manner—too hastily altogether, and consequently imperfectly done. But notwithstanding the imperfections of work done by the busy practitioner, if you were to see your patients one week from the time at which you operated with the engine, and realize the good results obtained by that practice, then I am sure you would agree with me that it is worth while to go still farther, and endeavor to cleanse every surface of every tooth. Your patients, after they have become acquainted with the benefits of this work, will insist on having the prophylactic treatment continued.

Now, along that line, I would like to give a little of my experience in the treatment of children. It is but a few years since the fact of a child coming into the dentist's hands was to it a source of dread. Today, in the practice of prophylaxis simply and thoroughly, it is a source of pleasure after he becomes interested. He realizes that he is not having teeth filled, and enjoys the treatment. If you start with a child and imbue his mind with that principle, imagine the condition of that child in later life, with the teeth in perfect condition, with few cavities, and I may say almost none, because I do believe, gentlemen, that mouths can be kept absolutely free from caries by the thorough cleansing of the teeth, save for imperfections in the enamel.

I want to say a word to the young men, and I am done. The impression has gone abroad that it is not worth while for the young man to devote his time—sufficient time—to the cleansing of his patients' teeth, consequently such work is being done in a haphazard manner. Now I want to say this, and I hope Dr. Ferris will express himself a little more clearly with regard to his methods of applying the dental formulæ which he presented.

I apprehend that he is doing it largely with the spray. This, I think, is one of the most important features in the practice of prophylaxis; it is one of the most valuable, and becomes one of the most pleasing to our patients. I want to say to the young men first, Do your duty. If you find yourself unable to purchase the outfit as presented by our manufacturers, then create one of your own. Go to your plumber and get a boiler; then go to your bicycle dealer and get a pump. But, you say, I have not the time to pump air into a boiler. Well, if it is not within your means to purchase the machinery for this, pump it in with your hand, and you will be a better man for it; it will develop your muscle as well as your appetite, and you will live longer, because you obtain good exercise, and will place yourself in a position to treat your patients in a most satisfactory and useful manner both to them and to yourself—not only satisfactory, but productive of the greatest good.

I might talk almost indefinitely on the subject of prophylaxis, because I feel very much imbued with the spirit of its usefulness, still I do not wish to divert the discussion from the original subject. As I said before I am not an orthodontist, and I must naturally digress from the subject, but if what I have said will be the means of starting the ball to rolling, I shall be very glad indeed to have had the pleasure of talking on the paper.

Dr. R. H. W. STRANG, Bridgeport. I appreciate greatly the importance of the subject before us this afternoon. It has afforded me great pleasure to listen to a paper in which the subject-matter is not purely theoretical, but in which facts are presented to us, and the proof thereof. Dr. Ferris, by the assistance of the bacteriologist, has been able to prove that his formulæ are effective, and a few of us have also been able to demonstrate it clinically. There are many reasons why we as orthodontists should appreciate the importance of prophylaxis. We are dealing with children mostly, and as you all know, children and tooth-brushes are not great friends. They will neglect their teeth even when there are no appliances on them, and certainly, when the latter

are present, they not only neglect these organs, but it becomes quite impossible to cleanse them, and the ligatures, bands, and arches are bound to gather food material which, unless removed, promotes the production of lactic acid, which is so destructive to the tooth-structure. Dr. Ferris mentioned the fact that we are working on patients poor in health, and as Dr. Kirk so strongly expresses it, lessened vital resistance is the primal factor in the detrimental work due to bacteria. Most of the children that we treat are, as has been said, troubled with enlarged tonsils, hypertrophied lymphoid growths, and adenoids, and bacteria multiply very rapidly in the recesses which this hypertrophied tissue affords. When we realize that a bacterium becomes a grandfather and a great-grandfather in a little over two or three minutes, we can perhaps see how quickly myriads of these bacteria are produced to do their detrimental work.

The use of the compressed air in forcing these sprays against the teeth and soft tissues is very important to us as orthodontists. In fact it is practically impossible to clean the mouth without the assistance of compressed air. Each time I see my little patients I use the stick and pumice and clean all around the bands as best I can; and then trust to the compressed air to remove the remaining debris, using an antiseptic formula in connection with the spray. I think we should emphasize greatly the necessity for the patient to use a mouth-wash after each meal. We cannot see our patients more than twice a week, and consequently there is plenty of opportunity for fermentation to occur between their visits, unless they use a mouth-wash regularly.

I think there is a great field for investigation along these lines, with promise of success. Again I would congratulate the essayist upon presenting to us facts, and not theories.

Dr. F. B. NOYES, Chicago. I am glad indeed to have listened to the reading of the paper. It was a very interesting one to me, on a subject which I think has been very badly neglected. Every prac-

titioner who has had any opportunity of seeing cases in the process of treatment has seen more or less damage done by the neglect to carry out proper prophylactic measures in cases of orthodontia. With the appliances in position our difficulties are enormously increased, as the essayist pointed out. It seems to me that the plans offered are practical and thorough. I would, however, desire a better plan for the patient to carry out the preventive treatment in the periods at home between visits to the office. I think the most effective method that the patient can employ is probably some form of syringe, by means of which he may keep the apparatus as clean as possible, using in addition the means suggested in the paper. On account of the ligatures and wires there must be proper antiseptic precautions where the metals come in contact with the soft tissues. You may say that there is small chance of danger in that direction, but it is our duty as dentists to preclude even such a minor possibility of caries-production.

Dr. GEORGE T. BAKER, Boston. I would like to congratulate the essayist on the paper which he has presented. It is certainly a subject which can be discussed by all with pleasure and profit. The subject of oral hygiene seems to be coming to the fore more and more, and this last winter, as perhaps some of you know, there has been an alliance between the societies of Boston and New York, and one result of their combined efforts will be the sending out of pamphlets and circulars to the different schools, calling attention to the importance of this subject; not especially in regard to orthodontia, but from the standpoint of dental hygiene in general.

Although the different methods described by the essayist are all very excellent, there is one other way by which we can maintain oral hygiene during the course of treatment of irregularities, and that is by the insertion of properly constructed appliances. I have not one word to say against the expansion arch with ligatures, because it is a very efficient appliance, and one which we must sometimes use, but there are the removable ap-

pliances retained by the removable spring clasp with which we should all be familiar. I was speaking of them the other day to a professor in one of the colleges in our city, and he said he had never heard of the removable spring clasp. Now, if a teacher can make such a statement, it is possible that some of the general practitioners here have not heard of it, and when the committee invited me to come and give a clinic before the society, I chose that subject, and hope my demonstration tomorrow will show some of the advantages of those appliances in the practice of orthodontia. They enable the patient to remove the appliance and brush the teeth, and the operator to remove the appliance and clean the mouth and the appliances as well.

I wish once more to thank the essayist for introducing the subject.

Dr. O. T. RULE, Meriden. I would like to ask the essayist if all of the five different drugs that he uses in one of his prescriptions are necessary? Or why he uses five different drugs, some of which have, it seems to me, the same properties?

Dr. I. B. STILSON, Stamford. The one thing from which I have derived more comfort than from anything else in this work is the use of compressed air. Dr. Gaylord said we should all have such an outfit. We cannot all have the best, but anyone can get a tank and pump air into it, and it is a source of great comfort in the practice of prophylaxis in connection with operations for regulating teeth. One of my little patients stops in every morning to have her mouth sprayed. She says she cannot do without it. In the afternoon on her way from school she stops in again to have her mouth sprayed. In this way I think we can keep the mouth in a better condition than by any other means.

Dr. FERRIS (closing the discussion). I appreciate very much the kind remarks in reference to the paper as a whole. There is one thing I would like to set straight, and which I particularly emphasized in my paper—and that is, that I do not object to mechanical means of cleansing the mouth. But after we have done

our best with the engine or with wood points in Dr. Smith's holders, we still have material clinging to the wires attached to the teeth; these wires must be cleansed, and this cannot be accomplished by mechanical means. If we use, as Dr. Baker suggests, the removable appliances, we can sterilize them; but that brings up the question of the comparative value of the two methods, and it would be too long a story to enter into a discussion of that subject. There is one point, however, of which I may speak, with regard to the removable appliances. You direct your patients to boil them in water once a day. They are set on to boil and are forgotten; the water evaporates and your appliances are found in one mass at the bottom of the pan. All your efforts are lost, which is very exasperating and disastrous. Before you can make another appliance, you are apt to lose a couple of weeks' work. That is the greatest annoyance I had in the use of one of the best-known removable appliances.

The remarks of Dr. Strang I appreciated very much indeed, because he has been using this method, and it is pleasing to hear the report of someone who has tried one's method of practice and found it valuable, even if you think you have it perfect in your own hands. Children's mouths require the greatest amount of attention from the prophylactic standpoint during the course of regulation, and in these cases it appears to be most practical.

In the use of my preparations I think the iodine solution is of all the most unpleasant ingredient in taste, and I play with my little patients in the use of it to take their minds off its taste. I assume the rôle of a magician, and say, "I will take this brown solution and spray into your mouth, and then you will expectorate ink." I follow the brown solution with the starchy one, and immediately they will expectorate ink. This is followed by sodium carbonate solution, with the information that the ink must disappear, together with the disagreeable taste. The ink disappears together with the disagreeable taste, and the child is pacified and the mouth sterilized. How-

ever, before I use these solutions, I remove every particle of debris that I possibly can by mechanical means. The solution of iodine has a more disagreeable taste to children than to older people, but they do not dislike it half as much as you may imagine, and it induces a healthy condition of the gums and is not irritating.

Dr. Noyes mentions the use of the syringe. That, I think, is a very practical addition to my method of work, and one that I will adopt. I have never used the syringe with the children, but think a child would be glad to play with the syringe, and its use would be valuable, provided he did not pull the wires off.

In answer to Dr. Rule's question in reference to the complex combination, I would say that the hydronaphthol is used for its antiseptic properties; the menthol is used for its antiseptic properties, and also for the property of lowering the temperature of the mouth through evaporation. The two oils are used simply to cover the taste of the hydronaphthol, the alcohol to dissolve the ingredients, and the tincture of capsicum to stimulate the circulation of the tissues by counter-irritation.

Motion was then made and carried to adjourn until the evening session at 8 o'clock.

Evening Session.

The evening session was called to order by the president, Dr. Crosby, who introduced as the speaker of the evening Dr. F. B. NOYES of Chicago, who gave a lecture on "The Structure of the Enamel with reference to Cavity Preparation."

Following the reading of Dr. Noyes' paper motion was made that the discussion be taken up at the opening of the morning session. The association then adjourned to the banquet hall, where a collation was served to the members and guests of the society.

WEDNESDAY—Morning Session.

The Wednesday morning session was called to order by the President at 10

o'clock. The first order of business, in pursuance of the motion made at the close of the evening session, was the discussion of Dr. Noyes' paper.

The next paper on the program was one by Dr. A. J. FLANAGAN, of Springfield, Mass., entitled "And They Say 'Comparisons are Odious,'" as follows:

AND THEY SAY "COMPARISONS ARE ODIOUS."

In the first place, gentlemen, I wish to correct an error in the printed program. The title of my paper should have been, "And They Say 'Comparisons are Odious.'" Perhaps after I have finished many will recognize conditions, be they fair or false, as I individually have recognized them for some years, and again there may be some here present who will in their kindness go out and say that Flanagan has a new disease—"dementia dentalis."

The good Book says, "The poor ye have always with you." It is my thought that had a second "good book" come forth in the last ten years, it would have contained the following: The pessimist we have always with us. The greatest thief in the dental world today is pessimism. He has been pursued for years by intelligent and reasoning practitioners, captured, convicted, and even confined, but only long enough to devise some way of escape—for he is still at large among us. Some few weeks ago I met one on parole. After exchanging greetings, I said: "How do you like this weather?" "Not much; I'm feared it's goin' to rain." "Well, how's times with you?" "Sorter so-so, but they won't last." "Folks all well?" "Yes; but the measles is in the neighborhood."

How dreary this world would be if we all thought alike; indeed, life is only made interesting because of a difference of opinion. Opinion may be criticism. All criticism can be of two kinds—constructive and destructive. The destructive criticism rampant in our calling at present is owned and controlled almost wholly by the pessimist. Says little

Johnnie to his papa, who is reading a monthly magazine, "What is a critic, papa?" The question is repeated three times before papa is able to bring his complex comminuted thinking back to his son by his side, for he has been reading "The Pessimist" in the *Items of Interest*. Papa suddenly kicks the cat purring at his feet, looks at Johnnie over the top of his eye-glasses, and says, "A critic, my son? Why a critic is a fellow that can't do it."

For some years I have listened with patience—or rather endurance—to many of the unfair and illogical statements made by these representatives of the destructive in dentistry. In the short time at my disposal I intend to treat of certain particular instances where the pessimism of the last decade in dentistry is as common as it is world-wide, and yet—to my knowledge—it has never been refuted successfully by a study and analysis of the statements made by these seemingly intelligent practitioners of dentistry. I refer to that everlasting comparison of dentistry to medicine. Were I to generalize this morning my argument would be like the Mother Hubbard wrapper worn by some members of the fair sex—while it seemed to cover everything, yet it touched nothing in particular.

I would now like to speak of the founding of dentistry as a profession. Perhaps there are many, both of the older and the young men present today, who may not know why dentistry of itself became a distinct calling. In 1839 Dr. Chapin A. Harris and that other famous man, Dr. Horace Hayden—to whose memory, be it said to the credit of Connecticut dentists, you are about to erect a memorial at Windsor, Conn.—were regular members of the medical profession, of good standing in the community, but practicing dentistry under the title of the medical degree. These two men tried to establish a chair of dentistry in the medical college at Baltimore; after refusal there they tried in other medical colleges, but did not succeed. To politely sum up the results of their efforts, they were kicked out. The medical colleges would

have nothing to do with dentistry. Now I want you to bear in mind today one thing, and that is, that dentistry is not of medicine because medicine would not have it.

We are attending a dental convention and Dr. A. is lauding the superior conditions in medicine relative to medical education in general. The *Journal of the American Medical Association* of August 25, 1906, is decidedly interesting reading, for it is the so-called "educational number." There are about 156 colleges teaching medicine in the United States. There is a college in Alabama which claims four separate sessions. Investigation proved each session to be six months. A college in California has extended its session this year from six to eight months. They—the faculty—are the examiners for preliminary requirements. A college in Colorado advertises good clinical material; population of the town six thousand one hundred and fifty—one hospital with forty beds. Quite a prominent university medical department—about midway between the North and South—advertises the following: "—in conformity with the spirit of the organic law of the university, is open to all, without regard to sex or race, who are qualified by good moral character, proper age, and suitable education." A very prominent college of Georgia advertises that first course students are required to give satisfactory evidence to the faculty of such educational qualifications as will be deemed necessary for the successful prosecution of their medical studies. Another college in Georgia, this year, changes from six to seven months' session. An Illinois college claims that attendance on the winter term of thirty-six weeks is compulsory, but that the summer term of twelve weeks is optional. Another Illinois college holds only evening sessions. An Iowa college in 1906 announced that in that year preliminary requirements would be a high-school course or its equivalent. A Kentucky medical school requires applicants to be sufficiently proficient in English, arithmetic, algebra, physics, and such Latin as would be acquired in one year's study. Louisiana

has a college giving four sessions of twenty-six weeks each. Mississippi has a college in a town of two thousand people. New York city has a college giving four sessions of only seven months each. North Carolina has a college in a town of eight hundred and twenty-four inhabitants. An Oregon school advertises that members of the faculty do not hold examinations for entrance. South Carolina has a school with this interesting statement of requirement: "or evidences of education satisfactory to the faculty." Tennessee has a medical department of a university where we are to understand that recommendations from two well-known physicians are requirements, and the clinical facilities are obtained in a town of six hundred people. Texas has

that says dental societies and their results are so different from and inferior to the medical ones.

This is a point that is talked about so much today that I fear that here in New England the men would be most interested in the conditions of medicine and dentistry as related to their respective states alone. Now, while the comparison of conditions here in New England is favorable to dentistry, it is my thought that perhaps we are willing to yield the point that possibly the conditions in other states are not so favorable.

The following table gives the number of physicians and dentists in the New England states and the number in their respective state medical and dental societies, up to October 1906:

	Pract. Med.	State Soc.	Pract. Dent.	State Soc.
Maine	1167	486	374	121
New Hampshire	671	403	190	93
Vermont	680	416	162	110
Massachusetts	5066	3044	1375 to 2000	515
Rhode Island	690	322	325	85
Connecticut	1238	780	550	208

a college giving four sessions of six months each. West Virginia has a college in a town of 1900 people.

A graduating physician is supposed to have a general knowledge of anatomy, materia medica, therapeutics, chemistry, surgery, physiology, bacteriology, biology, gynecology, pathology, toxicology, pharmacology, and a score or more of other "ologies." He is expected in from twenty-four to forty months to acquire all this, while a graduating dentist has been given from twenty-one to twenty-seven months to secure theoretical and technical training for his special calling. A memory of algebra comes to the rescue of the tired cells of my brain, and the problem is solved: 24 to 40 months is to general education and culture as 21 to 27 months is to special education and partial culture. To sum up the question of the comparison of medical and dental education, I have but one question to ask the pessimist: Which is the safest practitioner to let loose on the public?

You have met Dr. B. He is the fellow

Number of physicians and dentists not members of their medical and dental societies:

	Non-members.	
	Med.	Dent.
Maine	681	253
New Hampshire	268	97
Vermont	264	52
Massachusetts	2022	860 to 1485
Rhode Island	368	240
Connecticut	508	342

The lowest percentage of dentists in state dental societies in New England is 23 per cent. and the highest 68 per cent. For years we have had one of the editors of dental journalism, Dr. J. N. Crouse, claim there was not a state in the United States that had more than 10 per cent. of its dental practitioners in its society. If you will investigate you will find that the various medical societies in New England have a small percentage of their members in attendance at the annual meetings, and that the medical and surgical exhibits create greater interest than does the meeting

proper. To obtain essays of worth and men to discuss them is also a problem. If you will examine medical literature for the last decade you will find many articles and editorials treating of educational and society shortcomings. As illustrating a few pointed complaints see the following editorials in the *Journal of the American Medical Association*: January 20, 1906, "Contract Practice"; September 8, 1906, "Quack Doctors and Quackery"; January 12, 1907, "The Trading Stamp System in Medicine."

The *California State Journal of Medicine* for October 1906 has a most cheerful editorial for the depressed dentist entitled "The Sins of Physicians."

The refined dental conscience has been irritated lately by the evils of the proprietary drugs and nostrums. We—Tom, Dick, and Harry—in using some one of these, may feel that we are in strong and representative company, for you will find the deans and professors of many of our dental schools heading the list of testimonials. For some months a supposed M.D. has been traveling over New England selling office and town rights for the use of an "internal drug system for painless dentistry." The testimonials he showed from teachers of dentistry and members of examining boards would bulge the eyes of the manager of a fake remedy "testimonial-bureau" green with envy. The latest and real up-to-date testimonial is given on the engraved card of one of our best-known deans and oral surgeons. For the gem of testimonial we must, however, turn to one from a member of our Massachusetts Dental Society:

"AN HYPERTROPHIED PULP.

"You want to know, Dr. —, what I think of your preparations. Well, here it is. I can take your —, wet a pledget of cotton with it, dip that into your — (you ought to call it 'Benumber') put this on to an exposed pulp and get anesthesia in half a minute. Then bur out that sleeping pulp without pain. Then I put into the pulp-chamber a —, over this a permanent filling at first original sitting. I never remove the nerves out of the canals. That is unnecessary work.

"The above treatment is the acme of simplicity, and the results are satisfactory. No ulceration or other trouble.

"One year ago I had an hypertrophied pulp that filled the cavity of decay. I put on to the pulp some — for a few moments to benumb it; then cut it off even with the floor of the cavity of decay, and stopped the flow of blood with —; excavated the cavity, dried it out, then put squarely upon the pulp a —, over this a permanent filling. There has been no trouble with that tooth from that day to this—December 1906. Such a unique experience as this is something more than you claim, and is remarkable to the last degree.

"M. M. —, D.D.S., —, Mass."

This testimonial brings to my memory thoughts of the late Dr. J. Foster Flagg, when he lectured on those nice, quiet, sleeping pulps mentioned in this testimonial. One such was a sleeping beauty in September, a sleeping volcano in February, and an erupted volcano in March, and by May the Doctor of Dental Surgery was, in the mind of that patient, a Doctor of Doubtful Skill.

I am not going to weary you with a dissertation on the trouble medicine is having over the nostrum family, for all you need do is to write to the makers of any of their products a letter of inquiry as to the worth of their drugs, and you will be furnished with testimonials galore.

If you are interested in the opinions of medical men relative to this evil it would be profitable to read the following articles in the 1906-07 issues of the *Journal of the American Medical Association*: "Proprietary Medicines," by A. Jacobi, M.D., New York; "Proprietary Medicines and Their Abuses," by Geo. Dock, M.D., Ann Arbor; "The Physician's Responsibility for the Nostrum Evil," by Richard C. Cabot, M.D., Boston; "Proprietary Medicines—Some General Considerations," by Geo. H. Simmons, M.D., Chicago; "Effect of Proprietary Literature on Medical Men," by N. S. Davis, M.D., Chicago; "The Responsibility of the Medical Teacher for Existing Conditions," by C. S. Williamson, M.D., Chicago; "The Evils of Preparatory Medicines," by Joseph A. Pettit, M.D., Port-

land, Oregon; "The Elimination of the Nostrum Traffic, an Evident Duty of American Physicians," by M. G. Wilbert, Ph.M., Philadelphia; "Relations of Physicians to the So-called 'Ethical' Proprietary Medicines," by C. B. Kuykendall, M.D., Pomeroy, Washington.

Perhaps the most telling paper yet presented to the medical profession in relation to this great evil was that of the editor—Edward Bok—of the *Ladies' Home Journal*, before a large gathering of physicians in Philadelphia, entitled, "The Physician and the Nostrum."

The *Journal of the American Medical Association* is generally admitted to be the representative journal of the medical profession in the United States. While admitting this, it is well to remember that there are many other journals not of a representative nature, and some are not free from the so-called trade influence. There can be no question whatever that dentistry in the United States needs a journal to represent dentistry on lines similar to that journal which represents medicine. Well, how are we going to do it? From all that has been written and said for and against independent dental journalism, three great fundamental principles can be rescued from the fray: (1) The dental profession must be organized into a national society, representative of the calling; (2) the journal must have a subscription and advertising income large enough to be more than self-supporting—the subscription income must come mainly from your national society; (3) independent journalism cannot be built up by abusing and slandering trade journalism.

For some years the essayist has been connected with a successful publishing house in minor capacities—as a stockholder, contributor, and director. Naturally observations were made of those things or events which made for success. I will mention a few: We never held subscribers very long on pure sentiment; there had to be one head to every department; the head of every department gave his full energy and time to that end and had to be paid accordingly; we found no history of a successful publication

which did not depend on its advertising for its main income; the larger the subscription list, the higher were the advertising rates; last, but by no means least, we never overcame competition by abuse or slander, but only by giving a better publication. If you will take time to investigate the success and standing of the *Journal of the American Medical Association*, you will find it departs in no radical measure from those fundamentals which go to make up success in bringing forth the many other publications which cater to worlds other than medical.

Intelligent members of dentistry are pessimistic when the value of exhibits at our conventions are considered. We have been informed by some of the practitioners that medical societies in general did not countenance or have charge of the space where medical supply houses exhibited their goods. I find from medical men in position to know, that they sell space to the dealers in the same way that we do to the dental trade. Certain it is that the medical and surgical exhibit at the meeting of the American Medical Association last June at the Mechanics Building in Boston was controlled by that society. If you attended that exhibit you certainly must admit that conditions were such as to put to shame the wildest dreams of the dental exhibit objector.

The dental practitioners residing in places of large population and business activities have never known the lack of such a necessity as good dental depots, where all that is essential in appliances and materials is on daily exhibit. What of the practitioner many miles from dental depots, whose only chance to see a good exhibit is when he attends your conventions? When you condemn exhibits are you giving these members a helping hand? An exhibit rightly controlled is one most important part of a successful convention. I hear again the old claim that exhibits detract from the higher and better part of dentistry—that is, from the addresses and essays. If this last claim be true, then, to be logical, you must admit one of two things—either your addresses and essays or the *esprit de corps* of your membership are at

fault. A certain deacon late in life made a rather prolonged and extensive journey to foreign lands. (Report said he was not a deacon in his younger years.) On his return home he was much quizzed as to his opinions of foreign lands and cities. One of the elderly deacons was desirous of his giving them his impressions of Paris. He was asked several times before he consented, for there was an unusual tendency to pass by Paris. At last he said that it had produced the most peculiar impression of all—an impression that he could not chase from his mind—that he should have visited Paris before he joined the church. Can it be that the exhibit is the Paris of the dental convention?

Tight shoes are mighty uncomfortable, but they have a virtue—you forget your other troubles. Pessimists are mighty unreasonable, but they have a lasting virtue—they will cure your blues. There are good members of dentistry, there are bad members of dentistry, yet this one great fact stands out prominently—their badness is not due to dentistry or its teachings. There is the chaff and the grain, the tares and the wheat—together mixed, yet capable of separation. Then I say to you, gentlemen, separate! Error and truth exist side by side, even in medicine and dentistry.

Discussion.

Dr. F. T. MURLESS, Jr., Windsor Locks. I have found great pleasure in the perusal of the advance sheets of Dr. Flanagan's address, and it has been even a greater pleasure today to hear the words spoken, and to feel the vitalizing influence of his voice and enthusiasm.

Differentiation is the measure of progress and the gage of distinction, be it distance or time, beauty or attainment, to which consideration is given. Life for each individual is made up of distinctions and comparisons, and whether involving odium or honor, irritation or inspiration, is dependent largely upon the pessimism or optimism of the mind whence the comparison comes. Comparison may be the lure of emulation, the

goal of competition, or it may be a veritable ball and chain to the feet, hampering effort and paralyzing enterprise.

Dr. Flanagan's attitude is that of hopefulness and faith, and he resents the hampering of either men or dentistry by the conventional morbid criticism and self-belittlement which is so fatal to success. There is a great difference between success and perfection. True success is measured not only by ideals, but has another relation—which lies in how great an advance can be attained over and beyond what might be termed "a practical result." This margin of difference has its value, for this is the stuff from which we re-fashion ideals.

The eye and the mind are ever alert to discern perfection, though it is only by comparison that we even have the impression of it, or, more accurately, it is through comparison that we struggle to acquire a more distinct idea of what perfection may be. Any approach to perfection, whether displayed in a peach or a rose, physique or mind, arouses interest and appreciation. But quite as much as by these, our admiration and enthusiasm are aroused by the agency or method by which they have been developed, and in corresponding degree as vital interests are involved the instrument rises in importance, and to the degree in which dependability and freedom from accident are characteristic of its operation, the means rivals the products in its command of human interest. By these standards we make comparison between the kindred arts of medicine, surgery, and dentistry. We owe much to medicine. In fact, to most of humanity it is a refuge, a rock of safety, a staying hand, the object of heartfelt gratitude, but as a matter of fact it is not a certain resource. Even some of its most apparent victories are open to cynical comment from unsympathetic observers, and all because, as a matter of fact, it must divide the honors with the old stand-by—*vitality*. Then, again, medicine is largely palliative in its influence; its most positive data are concerned with methods which, for instance, control pain but do not touch causes.

Surgery, too, is a magnificent resource. Its benefits are indeed worthy of the highest praise, and its interferences with disease conditions are blessings; but surgery maims to heal. At best it gives back to usefulness but a marred and diminished specimen of humanity—physical perfection and efficiency, and capacities of resistance, as expressed in terms of vitality, have been impaired.

The dental outlook today is along far different lines. Our work is now in the direction of perfecting the organism. Dentistry is the focal point of modern prophylaxis, minimizing the influence of adverse forces, and directing development so that the initial impulse, as expressed in the embryo, may escape pathological and traumatic dangers, and develop a perfect specimen after its kind with body and individuality, having vitality for the resistance of the attacks of disease, and untrammelled by the need of surgery.

The instrument dentistry—God bless it!—is coming into its own. Its greatness is established, its honors await it, and, for what it *now* is, it has become the leader of the healing arts.

Dr. JAMES McMANUS, Hartford. In looking back over a few years and recalling the papers and discussions that I have heard, I could not help but feel today a pleasure, which I hardly anticipated, in hearing such a paper as Dr. Flanagan has read, and such a discussion of it as Dr. Murlless has presented, and somehow the whole volume of dentistry seems to rise about one hundred and fifty feet higher than the position it occupied in the years past. I have had the opportunity in the past—and I think Dr. Flanagan rather intended to give me a knock when he spoke of that—to talk to a good many men of dentistry, surgery, and medicine, but I do think, in all candor, that if any man looks over the literature of medicine and dentistry and compares what medicine is doing and has done with what dentistry is doing and has done, he will have to acknowledge that dentistry has far surpassed the older profession; that dentistry—in the character of the men in the profession, of the schools for

teaching dentistry, and the students turned out from these schools—is on a par with any of the other professions of the country. There is one thing which I think many dentists do not realize, namely, that from no institutions in the country are students graduated from whom so much is expected as of the graduate in dentistry. When a man graduates in medicine he is supposed to be just in the position to commence to learn, and he does just commence to learn because he goes out and practices on the public, and it is only by practice and experience that he reaches the point where he knows much of anything. Take the graduates in medicine of any college; you will find that but a small proportion of them get hospital appointments, and these men go there and remain for a period of two years, and have the best opportunities afforded anywhere to see the methods of practice of the best men in the country. The majority of graduates go out into practice, and have to learn through their mistakes and experience; but the dental student when graduated is expected to know it all. He must know enough to pass the examination and to perform operations, and, in addition, he must go before a board and perform operations under difficult surroundings and circumstances, and his operations must pass the test of the examiners before he is allowed to practice in any state in the country. The public and the profession demand more today of the dental graduate than they do of any other class of graduates in the country. I think that at the present time we have every reason to be intensely proud of the standing of our dental colleges and of our dental students, who I think are often far in advance of the graduates of other professions.

Dr. H. EVERTON HOSLEY, Springfield, Mass. I think Dr. Flanagan's paper offers a very good lesson for the dental profession to learn. Being pessimistic does not do you any good, or do the profession any good, neither does it improve the opinion that other people form of you. If the dental profession would form itself into an optimist club, and inform

the medical profession what good fellows we are, what we can do, and show them what we know, they would have a better opinion of us.

Dr. Flanagan has taught us a good lesson, and along this line I would like to speak in regard to what we say sometimes of another man's work. Let us say nothing but good, remember that the other man is a fellow practitioner, and that we all do some things of which we are not justly proud. Let us keep these things to ourselves, because the public judges us from what the profession says of its members. I think we should take a more optimistic view along the line of educating the public, and the profession is responsible for this education. I believe every dentist should take that lesson home with him.

Dr. JAMES E. POWER, Providence, R. I. The comparison of the medical and dental professions at this time teaches us that there is little accomplished by such a comparison. Each profession has duties to perform which belong to it alone, and upon which the other cannot enter.

In order that my position in this matter may be clearly understood, I shall preface my remarks by stating that I am proud to be even an ordinary member of the dental profession. I prefer dentistry to any other profession; by this I mean modern dentistry—that dentistry which embraces more than a knowledge of mechanics. I believe that as such it has unlimited opportunities for expansion. We are proud of the foundations upon which it was built, and from these foundations the rich successes which have been reaped have placed dentistry in a better position among the professions of the world. On the other hand, I believe that the dental profession, in many instances, has placed itself in a most critical position, and that it alone is responsible for that condition. We as a profession move the standard of our profession up or down, just as thermal changes move the mercury in the thermometer. We retard or facilitate the progress of dentistry just as the elements control the mercury. The public,

medical profession, and the other professions will accept the estimate upon dentistry that dentistry places upon itself. We are the ones who estimate our worth, and the world accepts us at our own estimate. One of the most detrimental factors is that tendency or inclination, on the part of many of our profession, to give unwise counsel to young men who seek their advice concerning the best course for them to pursue in order to become proficient in the science of dentistry. Many take these students (so-called) into their offices. They in turn, by a superficial study, get a sufficient poll-parrot or phonographic knowledge to enable them to pass the state examining boards, and in the eyes of the law they are dentists. The medical profession and the public will look down upon such a process of education, and naturally conclude that dentistry cannot amount to much, if a person can acquire a sufficient knowledge in a dental office to pass the examinations as prescribed by law, and acquire this knowledge in from six months' to two years' time. Physicians justly conclude that dentistry must consist chiefly of practical mechanical work. And naturally, when these men are compared with the men of the medical profession, the comparison is unfavorable to our profession. Where in this country can a man go into a physician's office and remain two years, and then engage in the practice of medicine? Still we affirm that the dental is the equal of the medical profession. I believe and hope that it is. On the other hand, I am forced to admit that the condition just described does not produce positive proof in the support of this belief, but does irreparable injury to us, individually and collectively, and so I say again, that in this way, if in no other, we prevent the onward march of dentistry.

A possible remedy for this is first to teach the public, and then the medical profession, that dentistry cannot be learned properly in a dental office. I cannot recall even one office in this country which affords the opportunity for a man to learn dentistry correctly. He may learn to make artificial dentures,

and to fill teeth, but, gentlemen, that is not dentistry. He can, with the assistance of a quiz-master, become proficient in theory to the extent of passing the examinations of the state boards, but the passing of the state board examinations does not make a dentist. To my mind the passing of an examination means nothing unless the candidate has acquired the knowledge by proper methods and through proper channels. Take for instance the Thaw case which has been tried recently in New York. This, like many other legal cases, may demonstrate how much an examination may or may not signify. There is no question in my mind that Mr. Jerome, under the guidance of a quiz-master and with a little study, could pass an examination before any state board of medicine in the country. But even after the law said, "Go ahead and practice medicine," a mere child would know that he would be an unsafe person to engage in the treatment of disease. Therefore, gentlemen, I say they who have learned dentistry under the conditions existing in an office, as before described, are not competent to treat the diseases which belong to the science of dentistry. I am speaking now particularly of the conditions of today. I realize that there are men who have never attended a college, that can and do practice dentistry successfully, and to these fathers of dentistry, who have accomplished so much with so little, I bow in reverence. But today dentistry offers greater and better opportunities for man to learn its secrets. These men have done much to draw aside the curtains of darkness and thus allow the light of knowledge to shine in. If they had been afforded the advantages of a dental education such as is within the reach of students today, I dare say that their accomplishments would be much greater than ours.

I believe that the progress of this profession is hampered also by the laxity of the ethical education of its students. In every school there should be given a course in ethics, if only consisting of one or two lectures. These lectures should be given to the graduating class,

teaching them the value of ethics; teaching them that the commercial and professional codes are synonymous. By this method, first bring to their minds the truth that dentistry is one of the learned professions; that the mission of dentistry is not beyond commercial ends and aims. We must receive money for our services, or we cannot pay our bills, and if we cannot, we burden society. Our ambitions, however, should not be based upon a commercial basis. There are men who are so anxious to practice dentistry for the sole benefit of humanity that they consider it unprofessional to even ask money for their services. The result is that they cannot respect the laws of society. Then there are other men whose commercial instincts are so highly developed that for them the accumulation of money is the one object in life. They do not attend dental meetings, such as this one, which may benefit them. Nor do they mingle with their fellow practitioners and thereby learn to know them. They do nothing but practice for the money that they may get in return for their services. These men never reach the higher or finer side of dentistry. There is another class of men—the fakirs—who by their alluring signs attract the poor man, who is anxious to pay his bills, but cannot afford to pay the fees demanded by some dentists; consequently, he falls into the hands of these charlatans, and we say that it is the poor man's fault. Not so much his fault, as it is his narrow estimation of dentistry from a certain low standard. Dentists should teach the public the value of dentistry. It is our duty to appear before the legislature and legislate against these unscrupulous men; not because they are advertising men, but rather because they are employing unskilled men, who are paralyzing all efforts in the scientific world, and who are increasing the misery of mankind to such an extent as to compel humanity to demand that something be done. If we do our duty in this respect, advertising offices, unskilled men, and the fakir will be things of the past. If, however, we must compare dentistry with medicine, compare it with the

medicine of the ancients during the time of Æsculapius, Hippocrates, and Galen, and set our standards on the same high foundations which characterized their ideals, and which made the medicine of the Greeks the medicine of the world. Let us work toward the high ideals that these men believed in, and which were part of their creed. We shall then reach the standard which Dr. Flanagan outlines, and take an incontestable position among the other professions of the world. It is the work which dentists do in the way of scientific work, such as was presented by Dr. Noyes last evening, that will help to raise the standard of dentistry. But, you say, we are not all qualified to carry on this grade of work. True, but it is equally reasonable to suppose that all of us are qualified to do things which Dr. Noyes cannot do; possibly not as valuable from the scientific standpoint, but equally valuable in helping to raise the standard of our profession.

It is these efforts which raise us above what Wendell Phillips termed hewers of wood and carriers of water. And, gentlemen, the embodiment of all this—of everything that is good, of everything which inspires us to work for the good of our fellow men and of our profession—is manifested in the one word “culture.”

In concluding, with your permission, I shall use the words of Matthew Arnold, the apostle, to outline what our duty consists of, viz, “To render the intelligent being yet more intelligent; to make reason and the will of God prevail.”

Dr. F. B. NOYES, Chicago, Ill. I was very much interested in the paper, and I think as Dr. Flanagan has said, we need more of optimism and less of pessimism; more men who are trying to boost the profession up, and fewer who are trying to pull it down. We need to encourage ourselves, and the best way to do this is to look squarely at our weaknesses, and not shut our eyes to them. I think every medical educator will admit very promptly, if he is familiar with the conditions, that the dental graduate is better fitted to practice his profession than is the medical graduate his. I am associ-

ated as a member of the faculty of a dental school with men in the medical school, and they say that the man who graduates from the dental department of the university with which I am connected is better fitted to practice dentistry than the man who graduates in medicine is fitted to practice medicine.

Now, to look at the other side of the question. It is a fact that while our students in the dental department are given the same course practically in histology that is given the men in the medical department, I would be afraid and ashamed to have my men go up for examination in histology before the medical faculty. They would not pass it. I appeal to you, then, and every chance I get I shall appeal to the profession, to help us change that condition. The fundamental principle of the professional school must always be that the faculty—the professor—presents the field to his students; he points out the subject to them; it is there for them to take, and I say to my students, “I cannot, like the high-school professor, stand over you with a club and bang it into your heads.” If I could give all of my time to teaching in a school, I could perhaps give weekly written quizzes, and grade these papers, and go over with care these four hundred examination papers a week and make these men imbibe as much histology as do the medical men. But I have to earn a living, and can only present the subject, and if they will not take it, I cannot compel them to.

Now, the same condition as that just described does not obtain in the medical school. When you present this subject to the men, they are eager for it—they want it; they know they must have it. What I want in the dental school is to have men as eager for what is presented to them as is the medical student—as eager to get an idea of the structures of the body in terms of its cells; to get an intelligent basis for the treatment of the disease conditions they must handle, and to acquire the knowledge which will give them the ability to understand the results of research work so that it will actually mean something to them, in order that we

may not hear—as so often we do hear at society meetings—"I could not listen to that long, dry paper, but if you will give me the formulas you use, I would be glad to have them." Now, the profession can change that—we who are trying to present these subjects—and I make it a strong personal appeal to do so; for I work myself out trying to teach this. I put all the "ginger" I can scrape up and throw all the energy I can get into my talks to the classes in order to tell them what they need, and when I come to read the examinations I wish I were dead and buried! I say to myself, What is the matter? Am I a fool? Can I not impress this necessity upon anyone? Where we most need help is in convincing the dental students that they need that kind of knowledge in addition to knowing how to make a filling and how to make a crown.

I gave an examination a few weeks ago to a class of sixty, and out of that sixty thirty failed, and I went before the class and talked to them for thirty minutes. I said, "Boys, I cannot make you learn this subject, but if I could only get you to know that now is your chance and induce you to take your chance while you have it. You are going out into practice, and I would say nothing that would belittle the necessity for mechanical skill, for if you cannot make a perfect filling, if you cannot treat caries, you cannot practice dentistry successfully; you will have to exercise your skill from six to eight hours every day, but after you leave here you won't have the opportunity to work three hours a day in a histological laboratory. Now you have the chance to learn the histology of the structures of the teeth; then your chance will be gone." And if the men of the profession in the country will send boys to us with that idea—that it is just as important to know something of and to be familiar with the mouth-structure, or of what must be the real basis for treatment of diseases of the soft tissues anywhere, as it is to know how to fill or crown a tooth—when they come to us we shall not be afraid to make comparison of the knowledge of the dental men with that

of medical men on any so-called theoretical subject.

Dr. FLANAGAN (closing the discussion). Some years ago, perhaps twenty, I journeyed to Philadelphia for an education in dentistry, after having studied for three years and four months in an office, and the reason why I did this was because it was then the consensus of opinion that the real dental center of education was Philadelphia. For the last five years I have made this claim, and if any of you gentlemen did not agree with me, I think you have now changed your mind, because we have had here an exemplification—a substantial something that leads us to believe the center is somewhat near Chicago at the present time.

Dr. Noyes has said that he becomes so discouraged that he would feel better, perhaps, if he were buried. Dr. Noyes, I want to tell you that there are other men, who are not so closely associated with the teaching forces of the colleges, that become just as discouraged on this question. The speaker is one of them; Dr. McManus is another, and there are many others who are equally discouraged. Dr. Noyes has spoken regarding the conditions in dentistry today. I want to thank him. The time is at hand when a man who stands prominent in the profession while yet the only thing you can say for him is that he has a fine practice, that he has a grand income—because he does nothing in return for his profession—instead of being a marked man for praise will be a marked man for condemnation. And why, gentlemen? Have you ever read the history of the plutocrats—the Carnegies, the Rockefellers, and others of that class? When they arrive at a certain time of life, what are they doing? They suddenly discover that they are on the wrong road to happiness, and these gifts of libraries, museums, etc., are an expression of what? Of the unhappiness in their minds; of an effort to rid themselves of the very thing that they thought was the indispensable thing to work for. Now I may be wrong in this, but that is my impression, and it seems to me that the dental societies, especially, should give recognition to the

men who are absolutely away from the financial end of it. Of course we all have to live; are obliged to, or should, pay our bills; yet this commercialism is in dentistry and to the detriment of dentistry. Do you suppose for one moment that if Dr. Noyes had gone into the commercial world, and had put the same amount of energy and vitality into a life of business, do you suppose for a moment that he would be a numbskull there? Don't you think he would have those thousands of dollars that so many are striving for? Instead of that, he is getting an existence as a dental teacher giving his all to the profession. How many of the dental students of the profession appreciate that which they receive from the men who sacrifice almost everything in order to give of their best efforts to them?

The President then called on Dr. E. Prentis, New London, for the report of the Legislative Committee.

The report of Dr. Prentis consisted in the reading of the proposed dental law, at that time being considered by the legislature. He stated that the committee was endeavoring to have the law passed at the present session if possible.

Dr. G. M. GRISWOLD, Hartford, then offered the following resolution with regard to the proposed dental law:

RESOLVED, That should any statute be enacted imposing any duties upon this society, that the officers and executive committee are authorized and empowered to take such action as may be necessary to carry into effect such statute.

Dr. ADAMS moved as an amendment to Dr. Griswold's motion the addition of the words "before the next regular meeting of the society."

Dr. GRISWOLD accepted the amendment, and the resolution was adopted.

The next order of business was the report of the Nominating Committee. Dr. McLEAN, chairman, presented the following list of nominations for officers for the ensuing year:

President—F. Hindsley, Bridgeport.

Vice-president—W. O. Beecher, Waterbury.

VOL. XLIX.—79

Secretary—E. S. Rosenbluth, Bridgeport.

Treasurer—F. W. Brown, New Haven.

Assistant Secretary—A. E. Carey, Hartford.

Librarian—R. H. Keeler, New London.

Editor—A. H. Spicer, Westerly, R. I.

Executive Committee—F. T. Murlless, Jr. (chairman), Windsor Locks; F. J. Erbe, Waterbury; W. V. Lyon, Bridgeport.

The association proceeded to ballot, and the result was the election of the list of officers above named.

Dr. MURLLESS moved that the newspapers of New London be given a vote of thanks for the satisfactory manner in which the meetings had been reported.

The motion was carried.

On motion, the Secretary cast one ballot for the list of applicants for membership, and the list was declared elected.

The Secretary then read a communication and resolution from the American Society of Orthodontists, as follows:

ST. LOUIS, MO., January 24, 1907.

THE CONNECTICUT STATE DENTAL ASSOCIATION:

Gentlemen,—The inclosed resolutions have been sent to the state dental societies and some of the local societies, with the request that they be adopted by those societies.

I have the honor to request on behalf of the American Society of Orthodontists that your society take action, and that your secretary notify me of the same.

Very respectfully,

FREDERICK S. MCKAY,
Secretary.

[Inclosure.]

RESOLVED, That in the opinion of the members of this society, the practice of paying or receiving any commission, honorarium, or any sort of fee, in consideration for the reference of a patient, is both unwarrantable and unprofessional; and be it

RESOLVED, That the payment or reception of any such commission, honorarium, or fee, to or by any member of this society, shall be sufficient cause for the expulsion of said member, by vote of the society after proper hearing and conviction; and further be it

RESOLVED, That in case of co-operation in the care of a patient between a general practitioner and a specialist, there shall be no division of fees, but each man shall render a bill for his personal services.

Dr. ADAMS moved that the communication be received and reported to the Board of Censors for recommendation.

The President then appointed Dr. Edward Prentiss and Dr. D. W. Johnston as a committee to conduct the new president to the chair.

Dr. CROSBY in presenting the new president said: It gives me great pleasure, Dr. Hindsley, to surrender to you the gavel of this society, as I know that you will always have uppermost in your mind the best interests of our society.

Dr. HINDSLEY. I thank you, Mr. President and gentlemen, for the honor you have conferred upon me in electing me president for the coming year, and for the confidence you have reposed in me. I am greatly pleased with the officers you have elected to serve with me, and we will endeavor to guard the interests of the society and give you a successful meeting next year.

The motion was then made and carried to adjourn until the next annual session.

AMERICAN DENTAL CLUB OF PARIS.

President—Dr. W. S. DAVENPORT.

Abstract Report of Meetings held in 1905 and 1906.

(Continued from page 994.)

(III.)

INCIDENTS OF OFFICE PRACTICE.

Dr. BURT reported the case of a lady who requested him to crown the upper right central and lateral incisors in order to correct a deformity caused by a pronounced elongation of these teeth. After several unsuccessful attempts had been made to find porcelain facings or crowns that would accurately match the natural teeth, the author decided to treat the case as follows:

The pulps of the two teeth were extirpated painlessly under cocain pressure anesthesia, the apical foramina sealed, and the natural crowns carefully cut off at the gum margin. As the central incisor overlapped the lateral, the cutting off of the crown of the former tooth was rendered rather difficult, but eventually it was successfully performed. By means of suitable bands and pivots the natural crowns were adjusted to the roots in alignment with the immediate neighbors, and the result was as satisfactory to the patient as it was to the operator.

Dr. L. C. BRYAN of Basel, Switzerland, presented a paper on "Silver Nitrate and Preventive Dentistry," of which an abstract follows:

SILVER NITRATE AND PREVENTIVE DENTISTRY.

In studying the literature of the subject—from the year 1854, when Brooks announced that silver nitrate would arrest decay, down to the present time—and in considering the authoritative conclusions of Miller, Stebbins, Franck, Taft, Szabo, Truman, Harlan, and Peirce, I felt that the thoughts and suggestions of those investigators, and the hopes held out by others, had been passed over too lightly, and that perhaps we had, near at hand, the means of accomplishing much good, if not with silver nitrate, at least with other untried remedies which would coagulate the albumin of the dentinal tubuli, stimulate the deposits of secondary dentin, limit the ravages of decay, and produce a denser and more resistant form of tooth-structure.

ture, so that the pain accompanying the operation of filling teeth might be reduced materially.

My experiments and tests have been made with silver nitrate, silver iodid, mercuric nitrate, actol, and itrol, though I soon gave up the last two as worthless. I have confined my operations and tests to silver nitrate and silver iodid. The treatment of silver nitrate, after its application to tooth-structure, with potassium iodid results immediately in the formation of potassium nitrate and silver iodid, the latter salt not having the tendency of silver nitrate to blacken the substances to which it is applied.

In using solutions of silver nitrate, it is almost impossible to prevent it from coming into contact with the mucous membrane of the mouth, the lips, or the hands or fingers, and without waiting for stains to appear on the latter they should be moistened with potassium iodid 10 per cent. solution. This immediately brings out grayish or yellow spots, which soon disappear from the skin, thus preventing the characteristic silver nitrate stain.

The deep black stain of carious or softened dentin or enamel is also prevented by the application of potassium iodid, but to obtain the therapeutic effects of the silver nitrate it is necessary to wait as long as possible before neutralizing it with the potassium salt. If applied immediately, or before ten to thirty minutes have elapsed, the action of the silver nitrate is greatly reduced, and the new substance, silver iodid, is soon washed away. After a half-hour the silver nitrate has so penetrated and fixed itself in the tooth-structure that the reaction leading to the formation of the silver iodid may be carried out, and the gray appearance of the latter compound will remain as fixed, apparently, as the black stain of silver nitrate.

After four years' use of silver nitrate, in a most thorough and systematic manner, I have come to the following conclusions:

(1) It is thoroughly self-limiting in its action, which quality prevents it from penetrating beyond the outermost layers of dentin—Dr. Truman's conclusions to

the contrary notwithstanding. Deep soft dentin in a cavity continued to decay under the blackest layer of superficial dentin which had been saturated every four months, for several years, with 40 per cent. silver nitrate solution.

The only advantage resulting from its use is that the process of decay is slower than when the silver nitrate is not used, but the apparent integrity of the covering of discolored dentin leads the operator into a false sense of safety while the decay goes on beneath.

(2) When applied to superficial hard decay the benefits are very marked, although if there be retention of fermentable substances its effects are very transient. Therefore, whenever the position of the cavity is favorable to the production of caries and perfect cleanliness be not possible, no reliance should be placed on silver nitrate to permanently arrest the process of decay; our hopes in this direction have sadly failed to materialize.

(3) Applied to what we the unconverted ones call "soft" or "frail" teeth, silver nitrate has had in my hands very decided beneficial effects on the structure of these weak teeth, and also in warding off the action of such acid substances as may be present in the fluids of the oral cavity. However, the good effect gained in these cases is counterbalanced by the staining and discoloration of these teeth, which in intensity is in direct ratio to the beneficial results of its action.

(4) Its effects on erosion are decidedly beneficial in arresting the eroding process, and from my long study of the action of the drug I am persuaded that its effect is accomplished through deposition of silver salts in the superficial layers of the dentin, which arrests the action of the erosive fluids on the surface of the teeth, and not through any effect on the structure of the tooth itself. The layer of silver salts protects the surfaces to which it is applied in the presence of superficial semi-soft decay; but too much reliance must not be placed on it to arrest the deeper form of decay, or to stimulate a deposit of secondary dentin, or to strengthen the dentin by stimulating the odontoblasts to deposit calcium salts in

the tubuli, to barricade the way as it were, to the destructive bacteria which penetrate them (*vide* Miller), as I had been led to believe after my first years of clinical study of the action of silver nitrate.

(5) Silver nitrate is an invaluable adjunct in preventive dentistry, when used in certain obscure cavities of difficult access before the insertion of fillings, especially metal fillings; that is, if due precaution be taken to thoroughly wash out or neutralize any free nitric acid in the silver salt. Much of the ill effects resulting from the use of silver nitrate arises from failing to neutralize this powerfully destructive acid. It is particularly destructive to the margins and substance of amalgam fillings when the proportion of silver in them is large.

I need not take up your time with a recapitulation of the results obtained with the other preventive chemicals mentioned

at the beginning of the paper. Suffice it to say that none of them have been able to permanently arrest deep decay in instances where perfect cleanliness could not be maintained.

The most negative results were noticed in the class which I had hoped to benefit the most, viz, the "great unwashed." The savior of their teeth is yet unborn. The effort to reach this lower strata of humanity—the "hewers of wood and drawers of water"—is the most discouraging in my experience as an occasional would-be philanthropist. The lack of appreciation of this kind of charity work on the part of the laboring classes is very disheartening to one who in the position of president of the Commission of Public Dental Hygiene of the International Dental Federation should preach and advocate the rendering of permanent dental services to the poor as advocated by Dr. Godon of Paris at the Fourth International Dental Congress.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., Sc.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, OCTOBER 1907.

EDITORIAL DEPARTMENT.

THE POSITION OF DENTISTRY.

THE evolution of dentistry as an organized profession owes its activity and vigor to the events which in 1839 established for it a distinct educational system, the foundations of a professional organization, and a periodical literature. It is common knowledge with students of dental history that the effort to engraft dental instruction upon the medical curriculum failed because the proposition to that effect made by the pioneer organizers of the dental profession in America was rejected by the medical faculty to whom it was in good faith formally submitted. As a result of this rebuff the means for providing a professional education for dentists was secured by the establishment of the Baltimore College of Dental Surgery in 1839, followed in due course by the creation of others as the necessity arose, until a half-hundred dental colleges at the present time bear witness to popular belief in the wisdom and practicality of the principle of distinct and special training for the dental specialist. At the period when this educational principle was first put into effective operation it was not lacking in opponents who antagonized the idea of an educational system for

dentists separate and apart from medicine, nor at any time since the formulation of the declaration of dental independence in 1839 has this underlying principle of dental education been without adverse criticism from a body of detractors who for various reasons have held that the dental curriculum is inadequate—that the dentist cannot be properly educated upon such a principle: that dentistry is a specialty of medicine, and that no one who lacks the medical qualification is properly equipped for dental practice. At various times and in many places debate has waxed warm over the discussion of the theme—"Is dentistry a specialty of medicine?" and the opposing views held by the disputants as to the principal premise and its various applications to the question of dental education have served to divide the dental profession into distinct parties, the major one contending for the separate and special training of the dentist, and the other, a small minority, demanding a medical training and medical degree as the only adequate preparation for dental practice.

The story is an old one. The ideas here outlined had shaped professional thought and created two opposing parties as early as the beginning of the eighteenth century, if not before. But though the difference above noted has continued to exist and to be active, it is certain that the conditions affecting both medicine and dentistry have undergone revolutionary changes—so great, in fact, that the problem of education in these professional activities is by no means what it was a half-century ago, so that the older points of view and the arguments advanced at that time in support of either side of the contention have little if any bearing, except it may be a sentimental one, upon the question as it presents itself for solution today. Certain facts have been clearly demonstrated by the lapse of more than a half-century of practical test and development. First, it is evident that dentistry as we know it, dentistry in all that it has attained, in all that it has accomplished for the relief of disease and suffering, in the extension of human life and the increase of comeliness by correction of oral and facial deformities, is the direct product of the system advocated and put into successful operation by those hardy pioneers who had the courage to establish dental education upon a distinct and separate basis as a specialty of the art and science of healing. Secondly, it is equally true that medicine in the sense in which that term is

used to designate the curriculum and system of education leading to the medical degree, is in no sense to be regarded as a factor in bringing about the accomplishment of the results which dentistry has thus far attained. And thirdly, it is also evident that the curriculum and system of education in vogue leading to the medical qualification is totally inadequate to fit the student for anything more than a mere fraction of the professional work which his degree by law empowers him to undertake; much less is it capable of fitting a student in any respect for the intelligent practice of dentistry.

We have always and consistently maintained that in education as well as in physics, and even in morals, the shortest distance between two points is a straight line, and that therefore the best way to educate a dentist is to teach him the things that a dentist needs to know and to do, as broadly and as thoroughly as may be possible—which is the principle in successful operation today in dental education. The many features of the medical curriculum without direct bearing upon the needs of the dental practitioner are a sufficient reason why they are superfluous as related to the educational scheme of the dentist, and why they are properly omitted. That they have cultural value, just as any other study in the broad domain of biological science certainly has, is freely granted; but that they are necessary, even though they may be desirable, is not to be admitted, especially when it has been shown by practical experience that the best dental work of the world has not been produced by the medically trained practitioner. On the other hand, it is evident that the dental practitioner must be amply trained in all of those departments which are fundamental to the healing art in general; and because of the admitted need for such training the advocates of the medical education for dentists demand that the dentist shall have the medical degree.

The sophistry of this proposition becomes apparent upon recognition of the fact that the medical curriculum does not furnish the training necessary for fitting the dentist for his special life-work, though the possession of the medical degree may and unfortunately does in certain cases serve as a stalking-horse into public favor, and at times also as a cover for incompetency in certain instances where its possessors practice dentistry under protection of the medical degree with no other qualification. The

medical degree is successfully used in this manner largely because the public at large is not sufficiently discriminating as yet to have discovered that the medical degree is not a dental qualification and that it does not mean that its possessor is qualified to undertake the treatment of every one of the ills that flesh is heir to, or that as a matter of fact it is in the very great majority of instances but the badge of an undefined specialism. That the medical degree cannot be more at present than the mark of a distinctly limited training in the science and art of healing, is so because the growth of the great body of knowledge with which medicine as a whole is called upon to deal has become so extensive that no human mind can compass it in four years, or four times that period. Hence specialization; hence it is that every medical man is the actual possessor of but a fraction of the knowledge that his degree indicates. This state of affairs is working out certain practical results in the inter-relationships of medicine and dentistry that are interesting and worthy of note. First, the recent reorganization of the medical profession of England under the broad and comprehensive association known as the Royal Society of Medicine, consisting of an affiliation of special societies as sections of the main body, in which logical arrangement the Odontological Society of Great Britain merges its individuality after a long and honorable independent career, and becomes the Odontological Section.

Verily, the medical profession of England, in thus including dentistry within its fostering care, has sundered the bonds of an ancient prejudice and ennobled its status by practically re-defining "medicine" so that in this new conception the word expresses what medicine really is—the whole art and science of healing. Similarly, the American Medical Association has within recent years officially included dentistry among its sectional divisions, and until the drastic action taken by the organizers of the Fifteenth International Medical Congress at Lisbon excluded dentistry as unworthy of consideration, our specialty was officially recognized in the international congresses of medicine. The Lisbon precedent has been followed by the Sixteenth Congress at Buda-Pest, so that the anomalous situation exists of official recognition by the two great Anglo-Saxon nations, while the international congresses of medicine exclude the dental specialty, excepting in so far as it is represented by those who practice

it under the medical qualification. As an outgrowth of the action at Lisbon and at Buda-Pest there has been formed an International Federation of Stomatologists by holders of the medical qualification in an attempt to revive the ancient sophism that a physician is by virtue of his medical qualification also capable of practicing dentistry. This recrudescence of an old idea which time and experience have shown to be conceived and continued in error has less significance in America than elsewhere, but in Europe it is a live and burning issue. The issue thus raised is of importance to organized dentistry in America to the extent that it definitely affects our international professional relationships, and it is necessary for the credit and maintenance of our professional ideals that we give our moral support to the influences at work—mainly through the effective agency of the *Fédération Dentaire Internationale*—that are pledged to and are working for the principle that dentistry is a distinct and separate specialty of the healing art, and that the successes and attainments of dentistry in the future as well as in the past depend upon the practical application of that principle in our educational system.

Guerini's Dental History.—We desire once again to ask the attention of the dental profession to the notice of the Committee on History of the National Dental Association regarding the publication of Dr. Guerini's History of Dentistry. The larger proportion of subscriptions to this work have already been obtained, and only about 150 are still needed to insure its publication. Surely there can still be found a sufficient number of interested practitioners of dentistry to insure the publication of this important work and place upon record the only authentic history of our profession that has as yet been written. The individual cost is small, while the aggregate good to be obtained is immeasurable. The work can be issued promptly after the subscriptions are all received. We trust that all will regard this as a matter of personal obligation, and that the subscriptions asked for will be quickly forthcoming.—ED. COSMOS.

A CORRECTION.

WE are indebted to the publishers of the *Dental Review*, Chicago, for the following titles of papers written by Professor W. D. Miller, which were omitted from the list of his works published in our issue for September in connection with his obituary notice:

"No Bacteria in Carious Dentin?" *Dental Review*, 1899.

"The Relative Effect of a Common Environment upon Enamel from Different Teeth." *Dental Review*, 1901.

"The Treatment of Sensitive Dentin, with Special Reference to the Production of Anesthesia by Pressure." *Dental Review*, 1906.

REVIEW OF CURRENT DENTAL LITERATURE

Conducted by JULIO ENDELMAN, D.D.S.

[*Les Annales Dentaires*, Paris, June 1907.]

THREE CASES OF SYSTEMIC INFECTION OF DENTAL ORIGIN. BY DR. DUBOIS.

Cases of septicemia of dental origin terminating in death are not infrequent. The first case that came recently under the author's observation was that of a cavalryman, who at regular intervals would call at the military hospital of Melun in order to be weighed and to undergo a physical examination, as he had been for several weeks past under treatment for incipient tuberculosis. His condition had markedly improved under a thorough hygienic treatment and a *régime* of over-alimentation, when he began to complain of severe toothache, declaring that he would have the offending tooth extracted the following week. This he did, but no sooner had he recovered from the operation than the third molar on the same side began to become troublesome. Shortly afterward Dr. Dubois was called to the hospital, where he found the patient in bed with a large swelling in the submaxillary region and affected with complete trismus of the jaw. Although his temperature was high, there was no mental depression. Upon passing a finger through a space due to the former extraction of two teeth, the writer found that the third molar—completely erupted—was badly decayed, and therefore concluded that the infection had originated from that source. Under chloroform anesthesia the jaws were forced apart, and it was then found that the anterior pillars of the fauces were highly edematous. It was decided to open the phlegmon at once, and to defer the extraction to some future time. A curved incision was made and with the aid of a hollow sound a large quantity of pus was evacuated. The immediate results of the operation were good and so continued for several days. The general condition of the patient improved.

and the mandibular trismus having decreased, the tooth was readily extracted. The latter had been the seat of caries of the fourth degree. The improvement lasted only three or four days, when the trismus reappeared—this pointing to a recurrence of the myositis—and the temperature rose to 103.1 F. The patient grew gradually weaker, lost in weight rapidly, and notwithstanding the efforts of the attending physician succumbed during the third week following the extraction.

The cause of the fatal termination in this case was without the slightest doubt the carious third molar, and its removal at the onset of the attack would have probably meant the recovery of the patient. Cases of acute septicemia of dental origin are met with more frequently than the casual observer would be inclined to believe; for while such cases are comparatively rare in private practice, in hospital practice they are frequently observed.

The second case was that of a young woman aged twenty-two, thin, pale, and feverish, presenting several fistulae in the cheek. She had been for about two months under treatment by a dentist for difficult eruption of a third molar. The dentist confined his treatment to mouth-washes of boric acid solution, under the pretext that it was impossible to introduce a forceps in the mouth. The fistulae appeared about a month after the first symptoms became evident. The patient lost in weight rapidly, and it was especially for this reason that she consulted a surgeon. An examination of the mouth showed that an incompletely erupted third molar was the cause of the fistulae. The tooth was consequently extracted, and under chloroform anesthesia in order to overcome the muscular contraction. The fistulae healed slowly and the trismus gradually decreased, but the patient's general state was still far below par, and the loss of weight

continued. Shortly afterward she developed pulmonary tuberculosis, and her condition at the time this report was prepared was very low.

In this case the timely extraction of the diseased tooth would have averted the tuberculous pulmonary infection, and although the patient was doubtless predisposed to the disease, she might have successfully resisted the infection if her nutritional equilibrium had not been so disastrously disturbed by the general infection from the diseased tooth.

The third case was one of ulcero-membranous stomatitis in a tuberculous patient twenty-five years of age. Five or six large ulcers were to be seen in his mouth. The patient complained of severe pain in a third molar, fully erupted, loose, and bathed in pus. The tooth was at once extracted. The patient entered a hospital for treatment of the mouth-condition, but died a month afterward from tuberculous stomatitis. The subject in this case was doubtless beyond cure even before the onset of the stomatitis, but his life might have been prolonged if the pyogenic inflammation had not occurred.

[*American Journal of Surgery*, New York, September 1907.]

THE PATHOLOGY AND TREATMENT OF TUMORS OF THE JAWS. BY FREDERICK EVE, LONDON, ENG.

The author (*British Medical Journal*) states that the majority of tumors of the jaws known under the term of "epulis" are myeloid sarcomata. They spring from the periosteum and are of a low grade of malignancy. He emphasizes the necessity of removing the neighboring teeth and of wide resection. Of thirty-four tumors of the jaw observed by the author, thirteen were sarcomata, eleven carcinomata, and seven were malignant tumors, probably arising from embryonic dental structures. One was an osteoma, one a myxo-fibroma, and one an endothelioma. The author discusses the pathology of the various forms somewhat fully, especially in regard to the embryonic tumors, and describes his methods of operative treatment. The chief causes of death after operations for removal of tumors of the jaw have been septic lung infections and hemorrhage, primary and secondary. To obviate these, Mr. Eve has been in the habit for years of performing pre-

liminary ligation of the external carotid and then laryngotomy. The former procedure also possesses the advantage that it enables the operator to remove any glands in the neck that may have been secondarily affected. Of twelve resections of the upper jaw made by the author in the past six years he has had but two deaths, or 16.6 per cent.

[*Dental Era*, St. Louis, August 1907.]

TREATMENT OF ACCIDENTS OF ANESTHESIA. BY HERMANN PRINZ, M.D., D.D.S., ST. LOUIS, MO.

The disturbances resulting from the administration of anesthetics may be conveniently classified as those affecting, first, the digestive apparatus; second, the circulation; third, the respiration; and fourth, the nervous system. Disturbances of the digestive apparatus usually manifest themselves in two ways, nausea and vomiting. Disturbances of the circulation manifest themselves externally by cyanosis or extreme pallor. Cyanosis is the expression of severe static hyperemia resulting from the accumulation of venous blood, viz, a surcharge of carbonic acid. Cyanosis is always present in dyspnea and asphyxia. Leptothymia or fainting is a temporary inhibition of the functions of the brain resulting from cerebral anemia, and is usually accompanied by more or less complete inhibition of all senses. A specific variety of collapse which is characterized by the suddenness of complete heart failure is referred to as syncope.

The treatment of the disturbances of circulation consists in applying such mechanical and chemical means as will bring about increased or renewed heart action. Artificial respiration and powerful rhythmic compression of the region of the heart are essential. Stimulation by chemical agents consists in applying strong irritating substances to the nostrils in the early stages of collapse. As a powerful dilator of the peripheral vessels the vapors of amyl nitrite are exceedingly useful. Three drops should be placed upon a napkin and held before the patient's nostrils. Flushing of the face and an increase of the frequency of the pulse follows almost momentarily. Nitroglycerin produces a similar typical nitrite action—the one-hundredth of a grain in tablet form, when placed upon the tongue, brings about the desired result.

Perfect respiration is, of course, absolutely essential to aerate the blood in circulatory disturbances.

Disturbances of respiration are of either mechanical or functional origin. To avoid any possible mechanical source of obstruction during narcosis, careful inspection of the oral cavity should invariably be resorted to before beginning the anesthesia. Artificial teeth, removable bridges, chewing gum, chewing tobacco, and many other things may be looked for in the mouth. Occasionally, in the early stages of anesthesia, inhibition of respiration is caused by a tonic spasm of the muscles of the tongue, thus forcing this organ against the soft palate and the posterior wall of the pharynx. The same phenomenon may occur during profound anesthesia in patients in the recumbent position. To overcome the stenosis of the larynx, the mandible should be thrown forward by pressing against the two rami posteriorly.

The typical organic impairments of respiration are known as apnea, dyspnea, and asphyxia. The difference between these three forms of suffocation rests probably with the severity of the disturbance rather than with the kind. They are primarily the results of the greater or less degree of paralysis of the respiratory centers. The supreme remedy is artificial respiration. As far as medication is concerned, the only drug that has proved of value is strychnin hypodermically in full doses.

Nervous disturbances during or following anesthesia are mental or motor. Physical excitement, a common occurrence in the preliminary stages of anesthesia, is observed principally in hysterical and alcoholic patients. Intense muscular action combined with clonic or tonic spasms frequently results in an increased pulse-rate, with more or less cyanosis and stertorous breathing. If the history of the patient to be anesthetized should point to hysteria or alcoholism, a hypodermic injection of morphin one-half hour before beginning the administration will materially lessen the period of excitement. Occasionally we meet with patients who will awake in an apparently normal physical condition, but without having regained absolute control of the sensorium. The patient remains for some minutes in a sort of lethargic sleep, which at times may reach a deep comatose

state. Smelling salts held to the nostrils, cold water dashed in the face, loud talking, or shaking will arouse the patient. Disturbances of the motor centers result in more or less severe spasms. Hiccough is often seen in the early stages of inhalation. Tremor of a single group of muscles or of the entire body is noticed more or less frequently after the inhalation of small quantities of the anesthetic. Similar tremors, as a result of indulging in other narcotics, such as tea, coffee, or tobacco, are noticed in those who are not *habituals* of these drugs. These muscle quivers are usually confined to the early stages of inhalation, and are not dangerous. Convulsions, combined with clonic or tonic spasms, occur more frequently under nitrous oxid anesthesia than under other narcotics. Tetanus—the persistent contraction of voluntary muscles—is frequently seen in the early stages of anesthesia; less, however, when chloroform is used.

Typical trismus, viz, tonic spasm of the muscles supplied by the fifth pair of nerves, especially those of mastication, is often very troublesome in dental anesthesia. As a precaution, a suitable mouth-prop should always be put in place before starting the administration. Severe forms of tetanic convulsion, causing the head and feet to bend backward and known as opisthotonos, are also seen during the early stages of anesthesia. All these muscular disturbances rarely require treatment. Carefully watching the patient, so as to prevent his hurting himself, however, is indicated.

Regarding the poisonous effects of cocaine, the author states that as there is no true antidote of that alkaloid, the treatment of its poisonous effects must be purely symptomatic. To overcome cerebral anemia amyl nitrite is recommended, and the patient should be placed in the recumbent position or even in that of complete inversion. Artificial respiration is essential in severe collapse. The lighter disturbances may be treated with strong coffee or caffeine *per os*.

For the purpose of readily meeting unexpected effects of anesthetics, every practitioner should provide himself with a stock of emergency drugs, consisting of—Hypodermic tablets of strychnin sulfate gr. 1/30; hypodermic tablets of nitroglycerin gr. 1/100; amyl nitrite five-drop pearls; validol; aro-

matic spirits of ammonia; camphorated oil; smelling salts; whiskey, and a hypodermic syringe in good working order.

The author concludes his article by sounding a note of warning against the indiscriminate use of the "new and harmless" anesthetics, and recommending the adoption of local anesthesia in dental practice, as being a safe and effective means of combating pain in the majority of cases in the practice of dental surgery.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, July 27, 1907.]

A CASE OF FOLLICULAR CYST OF THE MANDIBLE. BY DR. NEUMANN.

About six years ago the patient—a man aged about thirty—noticed a swelling on the left side of the mandible to which at first he paid but little attention, as it caused him no inconvenience whatever. However, as the tumefaction persisted it was lanced four or five times, in order to cause its disappearance, if at all possible.

These several operations having failed to bring about the desired results, the possibility of the tissue disturbance originating in an osteitis was considered, and another operation was performed in order to expose the mandible for the purpose of thorough examination. The result of this intervention was entirely negative, inasmuch as it revealed nothing of an abnormal nature in the mandible proper.

After this operation a fistula appeared in the mouth, and through it copious amounts of pus were discharged. At this time the patient was again examined, and it was found that the mandible was elevated, that the left side of the face was markedly swollen, and that the mucous membrane, likewise swollen from the canine to the first molar, was movable and of polished appearance, and upon pressure gave vent to a considerable amount of pus. All the teeth were sound except the canine, which, in addition to having a small carious cavity, had the appearance of containing a devitalized pulp. In view of the painless and slow progress of the disease, the absence of previous acute inflammation, the elevation of the mandible, and the fluctuation of the swelling, the case was diagnosed as one of follicular cyst. The cyst itself had no doubt developed through the

irritation induced by the decomposed root-canal contents of the canine.

The treatment consisted in the extraction of the canine, the root of which was found eroded, as is frequently the case with roots that have been bathed in pus for a considerable length of time. After the extraction the swelling decreased, and this eventually disappearing, the case was pronounced cured.

Two years afterward, however, a bulging or swelling of the tissues appeared in the region of the first molar, presenting the same characteristics as the one previously described, and giving rise to a copious discharge of pus when subjected to pressure. At the desire of the patient the tooth was extracted, but to the disappointment of both operator and patient the swelling did not subside. The patient was then referred to Professor Partsch, who, having operated twice with but temporary good results, decided as a measure of last resort to perform a radical operation, removing all of the cyst walls. Since then about a year has elapsed without the patient being further inconvenienced.

[*American Journal of Surgery*, New York, September 1907.]

ARTIFICIAL INDUCTION OF PHAGOCYTOSIS IN THE TREATMENT OF INFECTION. BY E. M.

The prevention of infection is still the most formidable problem with which surgery must contend. This problem was, for a time, attacked chiefly by devising methods to remove or kill by toxic means the offending source. The results of these efforts are known to all. The ideal antiseptic—that is, one that can be applied to human tissues in sufficient quantity to kill the germ without injuring the host—is still to be discovered, if indeed it ever will be.

It occurred to workers in this field that perhaps the problem could be attacked from the opposite direction, namely, by attempting to increase the powers of the human organism to withstand bacterial infection. Fortunately, much work had already been done to give investigators clues to the methods to be pursued. Indeed, the most recent efforts to obtain these results are based on one of the earliest theories concerning body resistance—the phagocytic theory of Metchnikoff. This theory is too familiar to require description;

it will merely be necessary to say that Metchnikoff and others showed that in the reaction to germ invasion certain cells of the body known as phagocytes, of which the white corpuscles of the blood are the predominant element, act as scavengers of the bacteria, devouring them and rendering them innocuous. An obvious conclusion would therefore be to artificially increase these phagocytes so that the chances of overooming infection could be correspondingly augmented. We know of many substances that promote exudation of the white blood-cells by chemotaxis; for example, ordinary salt solution, aleuronat, turpentine, the nucleins, and normal sera. Mikulicz was among the first to suggest the use of one of these substances as a prophylactic against infection. He advocated the intraperitoneal injection of nucleic acid before performing a laparotomy. Despite the weight of his authority and his apparently favorable reports, the suggestion has never been met with much enthusiasm.

Attention is again attracted to this form of procedure by the recent reports of Petit (*Medical Record*, June 22, 1907), and Chantemesse (Paris letter, *British Medical Journal*, June 22, 1907). Petit relates a large series of cases in which sterilized horse serum was used for the purpose of inducing leucocytosis both to prevent and to cure infection. He found experimentally that this medium produced the most active leucocytosis, and was less toxic to man than any other phagocytic excitant. In the abdomen it is injected in doses of 30 ccm. Gauze soaked in the serum is used as a dressing in the interior of the uterus or for ordinary wounds. Petit asserts that burns heal more rapidly under such a dressing than under any other form. Chantemesse reports the use of subcutaneous injections of sodium nucleate as a prophylactic and as a means of treatment for peritonitis, and relates cases of typhoid perforations that appear to have been favorably influenced by this procedure.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zurich, 1907, No. 3.]

IOTHION. By DR. H. ALLAEYS, ANTWERP, BELGIUM.

Since the publication of the article on iothion by Prof. Dr. von Metzniz about a year ago, Dr. Allaëys has been successfully using

this compound in the practice of dental surgery. Iothion is an ether of hydriodic acid, containing about 80 per cent. of fixed, chemically pure iodine. It is a yellowish, oleaginous liquid whose specific weight is 2.4 to 2.5. It is soluble in 75 to 80 parts of water; in 20 of glycerin, and in 2 of olive oil, and in alcohol, ether, and chloroform, etc., in all proportions. It can be incorporated in ointments up to 60 per cent., in anhydrous lanolin and in yellow vaselin up to 50 per cent., and in a mixture of anhydrous lanolin and yellow vaselin up to 40 per cent. Iothion is readily saponified and absorbed by the skin. An hour after the application of the compound on the skin iodine appears in the urine and saliva.

Its use in general therapeutics is principally as a substitute for the iodids, especially potassium iodid, inasmuch as its application on the skin is followed by the absorption of 50 per cent. of the quantity rubbed on, and further, because, although becoming rapidly diffused in the tissues, it does not give rise to any of the digestive disturbances which as a general rule are caused by the administration of potassium iodid. In dental surgery it is used almost exclusively as a counter-irritant, either in full strength or in 25 per cent. solution in olive oil.

[*Trans. Odontological Society of Gt. Britain*, London, June 1907.]

AN INVERTED MANDIBULAR THIRD MOLAR. By MONTAGU T. HOPSON.

The case reported by the author was that of a man, aged forty-eight years, who came under his care at the dental department of Guy's Hospital. For about a year he had suffered from intermittent attacks of neuralgia involving the right side of the face. These symptoms, however, had never been of a severe character. Twice during the year he had had a swollen face, the situation of the swelling being in the molar region of the mandible, for the relief of which he had submitted to the extraction of the second bicuspids and second molar. His immediate trouble was the continuation of the neuralgia and the presence of a sinus which discharged into his mouth.

Upon examination it was found that there was no apparent swelling externally or any

restriction in the free movement of the mandible. There were no teeth present distal to the first premolar, the first molar having been extracted at an early age. In the buccal sulcus, slightly in front of the granulating socket of the second molar, there was a small sinus from which a little pus could be made to exude on pressure. A fine probe introduced into the sinus showed its direction to be downward and inward, and its length about half an inch; no bare bone or tooth tissue, however, were encountered. A radiograph of the patient's face was taken, and showed a blurred spot which it was thought indicated a patch of dead bone. Under gas anesthesia the sinus was slit up and the region explored with an elevator, but nothing was found. The wound was packed with gauze and changed daily for a week, at the end of which time, upon removing the dressing, a third molar could be plainly seen at the bottom of the wound, occupying an inverted position with its crown downward. The removal of the tooth was effected with an elevator, and since then the patient has experienced no further trouble.

[*Archives de Stomatologie*, Paris, August 1907.]

CONTRIBUTION TO THE STUDY OF
SYPHILITIC FACIAL NEURALGIA. By
DR. G. RAVAUD, PARIS, FRANCE.

Although trifacial neuralgia is a disturbance of frequent occurrence, in the majority of cases the practitioner is at a loss as to the cause of the disease. It is not rarely, however, that the disease can be traced directly or indirectly to a syphilitic infection, and it becomes a matter of great importance not to disregard this possible etiologic factor, for if such be the cause of the disease a course of specific treatment will, in all cases, bring about a cure. Syphilitic trifacial neuralgia may appear at any stage of the disease, namely, during the second or third period, or concomitantly with any of the parasyphilitic manifestations, tabes dorsalis in particular. The pathologic anatomy of neuralgia occurring in the course of the secondary manifestations remains as yet to be worked out, although it may be surmised, as pointed out by Widal, Millian, and Crouzon, that the lymphocytosis and hyper-tension of the cephalo-rhachidian fluid is responsible,

not alone for the presence of dynamic disorders, but also for the production of true lesions in the affected nerve. Syphilitic neuralgia during the development of the tertiary manifestations is due to certain pathologic lesions at the present time well understood, such as gummatous osteitis, meningitis at the base of the encephalon, causing irritation of the trifacial nerve by compression, and gummatous neuritis, possibly with complete destruction of the nerve fibers. In the facial neuralgia of sufferers from locomotor ataxia, the lesions are situated in the spinal cord, in the medulla oblongata, and the Gasserian ganglion.

The author, after an exhaustive series of observations, is enabled to state that the specific form of facial neuralgia can be clinically differentiated from the ordinary form. When it occurs during the second period it is as a rule partial, involving principally the infraorbital branch. The occurrence of the paroxysms at night and the presence of objective disturbances of sensitivity, such as hypo-algesia or anesthesia (showing destruction of nerve fibers through gummatous neuritis), are pathognomonic of syphilitic neuralgia. In addition paralysis of any of the cranial nerves, the seventh and motor oculi in particular, in the presence of facial neuralgia, should be considered as an indication of the syphilitic origin of the disease. In the third period the neuralgic disorders assume the form of a persistent cephalalgia which, originating at the supraorbital ridge, radiates toward the neck and spinal column. Here, again, sensitivity is affected and the nasal reflex abolished, while trophic disturbances and paralysis of the motor root are not rare.

[*Archives de Stomatologie*, Paris, August 1907.]

ON THE ACTION OF IRON PREPARATIONS UPON THE TEETH. By DR. MORGENSTERW.

According to the author's investigations it may be said, in a general way, that almost all preparations containing iron exercise an injurious action upon the teeth. Those causing most marked erosion are the iodids and chlorids, and preparations containing them; while the albuminates and the manganates are practically innocuous.

[*La Odontología*, Madrid, September 1907.]

DENTAL CARIES DURING PREGNANCY.

By DR. E. AUWERS.

Dental caries occurring during pregnancy, or otherwise, may be due to a combination of systemic and local factors or simply to local causes. A pregnant woman is temporarily chlorotic and her mucous membranes weaker—that of the mouth in particular being less resistant and bleeding upon the slightest stimulation—and she unconsciously fails to care for her teeth as frequently as circumstances may demand. Consequently salivary deposits become more abundant, food debris accumulates in the interproximal spaces, and undergoing fermentation gives rise not only to caries, but likewise to that form of inflammation of the oral mucous membrane which has been designated by the term *stomatitis of pregnancy*.

On the other hand, the presence of disorders caused by a faulty metabolism, particularly during the first months of gestation, often results in the secretion of an oral fluid of a high percentage of acidity, which, acting upon the enamel of the teeth, causes fissures and imperfections in the hard-tissue covering, and this, of course, renders the teeth extremely liable to the action of caries-producing organisms. The prophylactic treatment should consist in carefully scaling and polishing the teeth at regular intervals, and also in the use of alkaline mouth-washes or tooth-powders.

Regarding the oft-discussed question of performing dental extractions during gestation, the author argues that such operations should be postponed until after delivery, particularly if the subject be of a highly sensitive temperament, and if her clinical history should include instances of abortion accidental or spontaneous.

[*La Odontología*, Madrid, September 1907.]

THE PRESENCE OF TEETH AT BIRTH.

By DR. JOAQUIN PUIG ORIOLA, MADRID, SPAIN.

The author describes the case of an infant physiologically below par, pale and emaciated, with triangular-shaped face, but with the fontanels almost completely ossified. The last phenomenon is in this connection of

more than passing significance, as it shows that the processes of calcification were unusually active prenatally, and accounts, to some extent, for the presence of eight lower teeth at birth. In addition to the eight teeth fully erupted—the four incisors, two canines, and two first molars—the presence of a bulging on each side of the jaw, at the point of eruption of the second molars, was ample evidence that the latter teeth would soon appear through the gum.

The clinical history of the family was good, there being two other children in the family in almost perfect health. However, the mother reports having suffered severe mental shock during the later period of pregnancy, through having been in the vicinity of a gas explosion of terrific magnitude.

The pointed canines were extracted, as they interfered with the feeding process, but the child died on the seventh day, practically from starvation due to his inability to assimilate nourishment.

[*Quarterly Circular* (Ash), London, June 1907.]

COMPOSITION OF PLATINOID.

The current issue of Ash's *Quarterly Circular* gives the composition of platinoid as follows:

"Copper,	60 parts
Nickel,	14 "
Zinc,	24 "
Tungsten,	2 "
	<hr/>
	100 "

—Horns.

"We lately had a piece of American platinoid analyzed, and here is the report:

"Copper,	60.50
Nickel,	15.97
Zinc,	23.00
Lead,	.12
Iron,	.35
Cadmium,	.02
Loss,	.04
	<hr/>
	100.00

"The analysts add: The sample contains no trace of platinum, gold, or silver.—C. A. S. & Co."*

* Note by the publishers of the *Quarterly Circular*.

PERISCOPE.

Soap as an Antiseptic.—As the result of a series of investigations, Professor Rodet concludes that common soap, apart from its value as a cleansing agent, is an antiseptic not to be disregarded.—*Exchange*.

Protection of Porcelain During Soldering.—Cover the porcelain with thin asbestos paper saturated with the investment mixture, catching the free ends in the investment proper; this will protect the crowns from the direct action of the flame throughout the operation.—*Dental Office and Laboratory*.

Putrescent Pulp.—On opening up a pulp-chamber in which there is a putrescent pulp giving out a most offensive odor, dip your broach in oil of turpentine and insert it in the canal; the odor will change almost instantly, most agreeably to both yourself and patient.—J. E. McDONALD, *Dominion Dental Journal*.

Gold Fillings in Children's Teeth Made Easy.—In the anterior teeth remove the decay only; place in the cavity a little cement, and with a hot, flat burnisher press into the cement Watts' crystal gold, holding it in place for one or two minutes. Wait ten minutes and finish with carborundum strips.—LEVI C. TAYLOR, *Items of Interest*.

Amalgam Manipulation.—Experimenters have found that by taking one standard make of alloy and adding various quantities of mercury, all showing a surplusage, each of such test fillings showed a varying change of form, one way or the other; and on investigating the reasons for this difference, they have come to the inevitable conclusion that it was the different ratios of mercury used which caused the variable change in the filling after it had been put in place. They found, when only a sufficient amount of mercury needed to make a homogeneous mass was used, that the filling, when placed in the cavity and properly burnished or malleted—I care not which, so that force enough be used to make perfect joints and proper condensation—was not subject to any change, and the results in every case were the same.—EDWARD BURGARDNER, *Western Dental Journal*.

Salivation.—A good remedy, according to Burnett (*Medical Summary*), is as follows:

R—Potassium chloratis,
Chloralis hydrastis, āā gr. xxx;
Phenolis liquefacti, gtt. xxx;
Aquæ, q. s. ad ʒviii. M.

Sig.—Use as a mouth-wash.—*Monthly Cyclopædia of Pract. Medicine*.

The Preparation of Cavities.—In the preparation of a cavity omit the rubber dam and employ a stream of tepid water to cleanse the field of operation. If the dam be used, the foul, infectious contents of the cavity are evaporated by the blasts of air employed, and puff out, contaminating the air breathed by patient and operator. Avoid the dam and dust-blowing wherever not essential to correct work.—W. C. COWAN, *Dental Digest*.

Amalgam in Posterior Teeth.—A well-inserted and carefully lined amalgam filling in the posterior teeth is not an uncertain filling. When finished with the same care that should be given to a gold filling or inlay it is not unsightly, as it can be kept clean, which is impossible with a badly finished filling, and upon this condition depends the durability of the work.—JOHN A. SCHMIDT, *Items of Interest*.

An Effective Ligature.—In cases where the clamp is objectionable for the retention of the rubber dam, and where the ordinary floss is not sufficiently bulky to prevent the rubber from drawing over it, a most admirable method of using the ligature is to first pass the floss through two pieces of rubber tubing, one piece for the buccal and one for the lingual side of the tooth. This is much to be preferred to stringing beads on the ligature, or using other means of holding the rubber dam. The tubing should be the smallest size sold at the rubber stores, the kind used for slipping over the bows of spectacles where they rest on the ears. To insure against leakage, drop a little sandarac varnish between the tubing and the enamel on the buccal and lingual sides.—E. M. S. FERNANDEZ, *Dental Review*.

Sharpening Files.—In an electrolytic method of sharpening files, the tool is connected with the positive pole of a battery of 12 Bunsen cells, and placed in a bath of 40 parts sulfuric acid in 1000 of water. The negative electrode is a spiral of copper wire encircling the file without touching it. The process requires ten minutes, when the renovated files will be found as satisfactory as when first made.—*Scientific Miscellany*.

Burnishing a Gold Plate to a Tooth.—When burnishing a piece of gold to a lingual or other aspect of a tooth, a good practice is to place a piece of silk ribbon over the gold, and carry the ribbon around the tooth so as to have both ends meet on the opposite side, and hold them firmly with the fingers, thereby holding the gold plate in place. Under this silk the gold may be burnished with very little trouble.—E. M. S. FERNANDEZ, *Dental Review*.

Repairing Gold Fillings.—My observations have led me to place a great deal of faith in amalgam used in the patching of gold fillings which have failed, either at the cervical margin or, as usual, at the approximal margin. There is a peculiar action between gold and amalgam that renders amalgam particularly useful as a patch alongside of the gold, and I believe the same holds true of tin, and for the same reason, that there is a certain electro-chemical action between the base metals of the amalgam or the tin and the gold filling.—W. V-B. AMES, *Dental Review*.

The Use of Flexible Rubber in the Retention of Artificial Dentures.—This method is especially applicable to dentures which, owing to the extreme flatness and hardness of the tissues, will not stay in place.

The process of attachment of the flexible strip is as follows: The denture, either upper or lower, is made and vulcanized in the usual manner, and the edges of the plate trimmed so as to give free play to the muscles when the mouth is opened or closed, allowing, in the case of the lower, for the free movement of the tongue. Then a ledge one-eighth inch or slightly less in width is cut with a fissure bur to the depth of the thickness of the flexible rubber to be used. This ledge or groove is made completely around the rim or edge of the plate on the side next to the gums and across the posterior edge of the plate, so that it is continuous around the whole plate.

The bottom of this ledge or groove is painted

or coated with a solution of base-plate rubber in chloroform, and allowed to dry. Then cut a strip of Doherty's flexible or palate rubber, three-sixteenths of an inch or slightly more in width, place it carefully in this ledge, and pat it down tightly and smoothly with a spatula, the fingers, or other instrument, leaving the flexible rubber projecting beyond the edge of the plate. The ends of the piece or pieces of flexible rubber are thoroughly united by means of a warm spatula, so that a continuous band or piece is formed around the plate.

The whole is then invested in plaster in the flask and re-vulcanized, after which any necessary trimming and polishing may be done.—NEWELL H. GROVE, *Dental Summary*.

Simple Method of Making a Gold Inlay.—Force a small piece of warm modeling compound into the prepared cavity; chill, remove, and place the compound in the swaging device. Take pure gold No. 38 gage and swage it with the aid of spunk over the modeling compound impression. Take the swaged matrix and place it in the cavity; with a small piece of spunk and a burnisher, burnish to perfection. Warm the piece of modeling compound, place it in the matrix while in place in the cavity, and have the patient bite on it. Trim the compound to occlusion, then chill and remove it. Place the matrix and compound back in the swager, and swage the top part of the inlay. Remove the entire piece from the swager, and cut a vent in the matrix through which solder is to be flowed. Remove the matrix, chalk it thoroughly, place the two pieces together, solder practically full, finish, and set.—HOLLY V. BROCKETT, *Western Dental Journal*.

A Few Ideas on Taking the Bite.—Trial plates should be made to conform to the casts. These may be molded over the casts with the fingers by softening some impression compound, or other trial-plate material, or, in short, any material which will not be too thick and at the same time will retain its rigidity in the mouth. I find that compound, as it is commonly called, answers my purpose admirably. It is easily and readily molded over the casts, and is rigid enough in the mouth to retain its position. From this material, then, a trial plate is molded over each cast, and this should be removed and trimmed with a pair of shears (metal shears answer best) before the material has set completely. Replace them upon the casts and re-mold them again to place, softening a little if necessary. When the

trial plates are perfectly fitted to the casts they should be carefully trimmed along the margins with a file and then sand-papered, so as to render them comfortable when placed in the mouth, for the reason that a "first impression" on the insertion of these trial plates may have a wonderful effect upon the patient—rough-margined trial plates may create in the patient's mind the idea of misfit, etc. When these trial plates will go on and come off the casts readily they are then ready for the wax rims. An ideal trial plate must be firm and rigid enough in the mouth to endure the necessary pressure to secure the "bite."—W. NELSON, *Dental Record*.

A Method of Dividing Plaster Impressions before Removal from the Mouth.

The method is especially suited for dividing plaster impressions of the mandible in those cases where the posterior tooth has considerably tilted forward, locking the impression. The method consists of tying a wire ligature around each tooth, leaving a long end to each ligature, bringing these over the tops of the teeth and tying them together across the space. A piece of tin foil is then hung from this ligature, and the plaster impression taken with this *in situ*. This causes the plaster impression to break easily into two portions when it comes to be removed, being nearly divided by the septum of tin foil.—C. E. COMBE, *British Dental Journal*.

Amputation of Dead Roots of Molars in the Preparation of Bridge Abutments.

—Let us suppose the bicuspid teeth and the second and third molars on one side of the maxilla have been extracted, but that the first molar is still in position, with the palatal root badly necrosed, and the vitality of the pericementum completely destroyed owing to suppurative inflammation. In addition, resorption of the alveolus having been very pronounced, there is no longer any attachment to the surrounding tissue; in other words, the root is absolutely dead. Are we justified in extracting such a tooth?

In the case cited the entire palatal root should be amputated, for we cannot hope to correct such a pathological condition by medicinal treatment alone; and when this is accomplished suppuration will invariably cease almost immediately, and the remaining roots will become firm in their sockets, retain the tooth rigidly in the process, and regain a usefulness that is nothing short of miraculous in the eyes of the patient. What a fatal mistake it would have been to have removed such a tooth, for when the overhang-

ing walls are trimmed down so as to parallel the remaining roots, you will have a posterior support for your bridges that will give very gratifying results.—FRANK E. LOGAN, *Dental Register*.

Preparatory Work in Artificial Dentures.—I have found it a valuable help in mounting plain teeth when they are in position on the cast before the final waxing up is given, to place plaster of Paris on the labial, buccal, and masticating surfaces of the teeth, and with the point of a knife or spatula press it between them, care being used to keep it away from the necks. It serves the three-fold purpose of preventing teeth changing position when the final waxing up is given, it keeps the rubber from between the teeth, and prevents them from loosening in the flask when the wax is removed and the case packed.—J. F. KNAPP, Brooklyn, New York.

When Shall We Devitalize the Pulp of Teeth to be Crowned?

—If the preparation of a tooth can be accomplished without any undue mechanical irritation or discomfort to the patient, the proposed bridge not being an extensive one, I believe in preserving the vitality of the pulp; but when the piece is extensive, and I feel that there is the slightest possibility of any pathological disturbance resulting in the future, I do not hesitate to resort to a preventive procedure in every instance, and so devitalize. To accomplish this I prefer the use of cocaine to arsenic, for I believe the latter is responsible many times for the inflammatory conditions that develop later, and which may terminate in periodontal or alveolar disease.—FRANK E. LOGAN, *Dental Register*.

Failure Resulting Through Anchoring a Bridge in a Gold or Amalgam Filling at Each End.

—A number of failures in bridge work have resulted where the operator aimed to make a permanent piece of work by anchoring the adjoining teeth by means of either gold or amalgam fillings or gold inlays. It is not surprising that such work is unsuccessful, considering that the principle is entirely at variance with the results desired. It is impossible to suppose that an approximo-occlusal cavity of fairly good proportions can support the strain of mastication that is exerted on two or even on one additional tooth, when experience teaches us that fillings in similar positions and of like dimensions frequently break down through the force exerted upon them. For in the molar region, as you

are all well aware, there is a strain of from 70 to 250 pounds per individual tooth. Furthermore, by virtue of the elasticity of the alveolar process and the joint peculiar to the natural tooth, there is always a certain amount of movement to be overcome, and the security this mode of attachment offers is, as a rule, far from sufficient; either the filling becomes loosened or the bar becomes detached. None of us would think of filling two opposing approximal cavities in adjoining permanent teeth with one filling and expect a successful operation, yet the principle is identical. This class of work is not practicable, and seldom permissible, and cannot be expected to be successful, excepting in a case where the occlusion is very slight or wanting.—FRANK E. LOGAN, *Dental Register*.

Cases in Which Gold Inlays are Particularly Indicated.—The places in which gold inlays are preferable to porcelain ones are in the posterior teeth where large restorations are to be made, especially those including the molar surfaces where occlusion is an important factor, for you cannot make as perfect an occlusion with porcelain as with gold by the methods of gold inlays which have been devised. You cannot with porcelain make, primarily, as good an occlusion, and secondly, having failed in either case, you can perfect your occlusal surfaces better if you are dealing with a gold inlay than you could with a porcelain inlay. Occlusion is a very important matter, and that is one instance in which the gold inlay is preferable to a porcelain inlay.—R. OTTOLENGUI, *Items of Interest*.

The Relation of Art and Science in Dentistry.—No dentist need settle down with the regret that his opportunities were limited when he entered the profession. Scientific study and research are within the reach of everyone who has the ability to become a dentist. Finally, every dentist must be something of a scientist in order to read and comprehend the foremost writers of dental literature, to say nothing of appropriating their ideas. He can well afford to take time for this, for the error that science is impractical and unremunerative is being dispelled. It arose, no doubt, from the conception of the study of science for its own sake, which in a profession like that of dentistry might yield small, if any, returns; but when pursued with a true understanding of its relation to the art which it supports, it may be in the highest degree practical and remunerative. If a worthy interest in his pro-

fession would lead him to aim higher than personal proficiency and business returns, he may be stimulated by the fact that the history of discoveries and inventions show that they are rarely made and perfected by any one person. It is the small contributions of the many that result in a great achievement. Lavoisier, whose name will ever be told in the history of chemistry, made no discoveries in the science, but gave new explanations and methods of attainment concerning the products of others. The science had reached the advancement of his day through the efforts of others, many of them obscure perhaps, and his was the genius that gave it a new aspect. The toilers who made his work possible were as great benefactors of humanity as he. Study, improvement, and the promotion of human happiness are peculiarly the accompaniments of a dentist all along his life-work. It is an accepted fact that a study of the sciences, as well as a study of the classics, brings culture; and it brings what is perhaps of more importance in the struggle and modern rush of business life—self-helpfulness.—J. FREMONT BURKET, *Kingman, Kansas*.

Failures in Crown and Bridge Work Resulting from Faulty Technique.—Perhaps the most common and flagrant evidence of failure is to be found in the inflammatory condition—which is so frequently observed—of the tissues surrounding the necks of roots supporting artificial crowns. Indeed, even at the present time, it is surprising how very few cases we see which do not show such evidences to a greater or less extent.

Is this condition to be attributed to a chemical or to a physiological incompatibility between the crown and its supporting root? Possibly to the former in rare instances, but certainly to the latter in most cases, and artificial crowns are physiologically incompatible, mainly, if not only, because of the mechanical irritation which they offer. This disturbing element, however, arises from a single source—faulty adaptation—and this can in turn be attributed to a single cause—faulty technique, either in root-preparation or in the adjustment of the crown. Therefore it does not matter so much what type of crown be used; if there is no chemical incompatibility, physiological disturbances can be overcome by avoiding irritation, and the possibility of irritation can be avoided by proper adaptation.

So neither of the somewhat mooted questions as to whether a band encompassing the end of the root and passing within the free

margin of the gum is the cause of the trouble or not, or whether one should or should not be used, is the vital issue, for the cause can only be removed by obtaining an adaptation which precludes it. This brings us to a consideration of the combined therapeutic and mechanical requirements incident to the preparation of roots, and to the conclusion that they are often not properly observed, for if they were, fewer failures of this type would be noted, and greater comfort and longevity would result.—HART J. GOSLEE, *Dental Summary*.

A Precaution Before Operating.—The use of alcohol before applying the rubber dam cannot be urged too strongly. Accumulations heavily laden with bacteria are found in the mouths of most patients, about the necks of the teeth, at the gum margin. If the dam is applied without removing and destroying the germs in these accumulations, infection of the gum is very often the result, and many cases of pyorrhea might be traced to such negligence. It should also be used to wipe the tooth off after the dam is applied, as the mucus provides an unclean surface over which to work, and I think hand instruments are less inclined to slip when used upon a tooth which is thoroughly cleansed of mucus and other accumulations found there. If a ligature be used, as is generally done, it is almost sure that some irritating substance will be forced beneath the gum; if you do not use the ligature, the rubber will adhere very much more tenaciously to the tooth when cleansed with alcohol.—J. F. WALLACE, *Dentist's Magazine*.

Adjusting a Logan Crown.—After grinding the root to the desired shape, select a crown of suitable shade and size and grind away the palatal portion. Now fit a platinum disk No. 38 gage to the end of the root; punch a hole in the disk with a mandrel of the same diameter as the pin of the Logan crown. Readjust the disk until the fit is perfect, and force the pin through the disk to its proper place. The latter will hold the pin with sufficient firmness. Porcelain body is now placed in the V-shaped space between the disk and the ground palatal surface of the crown. When the bakings are completed, and the correct contour obtained, the platinum is removed.

By this method the complete strength and beauty of the Logan crown are retained, and an absolutely perfect joint secured. No investment or soldering is necessary.—J. D. PATTERSON, *Western Dental Journal*.

Precautions in Soldering.—Discouraging failures have resulted from the unskilful use of the blowpipe, and the utter disregard of certain requirements that must be observed if we wish to eliminate the danger of accidents, such as burning the case, checking the porcelain facings, and balling up of solder. It is necessary that all parts to be soldered should be absolutely clean before such procedure is attempted; any wax on the tooth should be removed by placing the piece in chloroform; the metal parts should be treated in an acid bath to remove all oxides and base metals, and thorough apposition of the cusps and backing should be observed. When backing the tooth allow the material to project beyond the approximal sides, so that when the teeth are assembled in the bridge and ready for soldering, the backings will lap upon each other, thus avoiding those troublesome joints between the facing, as well as the objectionable V-shaped spaces.

In investing the case, use as little material as is practicable to hold the parts firmly in position. I do not know of a more admirable substance for this work than that used by Dr. Fred A. Peeso of Philadelphia. It is ordinary red bird-gravel or sand, two parts to one of plaster, which gives a dense and strong investment, capable of being carved or trimmed to a very compact form, and showing no perceptible shrinkage when heated. When ready for soldering, place the case over a burner on a disk of copper plate, so as to diffuse the heat, making sure that the porcelain facings are heated first, for as you are all well aware, the porcelain, being a mineral substance, absorbs the heat more slowly than the platinum pins, and consequently the expansion of this substance should precede that of the pins; otherwise a fractured facing is liable to result. Therefore be careful to apply the heat gradually and uniformly, dusting the surface to be soldered very lightly with dry powdered borax, and increasing the temperature of the piece with the blowpipe until it reaches a red glow.

Now you are ready for the actual soldering. The solder having previously been cut into a long strip, dip it in liquid flux and apply it to the particular part of the bridge you wish to unite, at the same time cutting down the flame so that it will play directly on the extremity of the solder; unite the cusp to the abutments first, and then the cusps to each other, for by so doing the tendency to shrinkage will be overcome by avoiding an excess of solder in any one area. When this has been done, keep feeding the

solder in at the lingual edge of the cusps until the desired contour has been acquired. By manipulating the solder in this manner, you can direct it to the exact spot you wish it to flow; there is no "balling up" and no

air-bubbles are confined—to cause a porous piece when completed—and if the slightest care be exercised it is next to impossible to burn the bridge.—FRANK E. LOGAN, *Dental Register*.

OBITUARY.

DR. HENRY DONALD WILSON.

DIED, of apoplexy, at his office in Bainbridge, Ga., July 12, 1907, in his fifty-ninth year, HENRY DONALD WILSON, D.D.S.

Dr. Wilson, one of the most highly respected citizens and members of the dental profession of the South, was born in Abbeville, S. C., August 5, 1848. He served in the Confederate Army during the Civil War as a member of the First South Carolina Regiment, which he joined when he was thirteen years of age, and in which command he remained until the close of the war. Returning home he passed through many trials and difficulties incident to the wreck and devastation of that period wrought by the war, but eventually was by reason of his energy and perseverance, enabled to enter the Pennsylvania College of Dental Surgery, from which institution he was graduated in 1874. He entered upon the practice of his profession in Abbeville, S. C., continuing to practice there until 1888, when he removed to Bainbridge, Ga., and on October 17th of the same year was married to Miss Clifford Harroll of that place. A son and a daughter were born of this union.

Dr. Wilson was a member and at one time president of the Georgia State Dental Society. He loved his profession and had a large and increasing practice, his skill and intelligence gaining for him an enviable reputation not only among his appreciative *clientèle*, but among his professional colleagues throughout the state. Besides being a successful business man, he was possessed of a high degree of inventive talent, some of his inventions in connection with agricultural machinery having been successfully exploited and used and for which he received patents. A public-spirited man and interested in the public

welfare, he was active in the promotion of all that contributed to the prosperity and welfare of his city.

But above all Dr. Wilson was loved and honored for his devoted Christian spirit and high personal integrity. Strong in his convictions of right, he was the embodiment of all that goes to the making of a high, manly character. Brave, courageous and sympathetic, he was the friend of the fallen and a practical helper of those in need of assistance. His record as a citizen and as a husband and father is one of which his community and his family may well be proud.

Dr. Wilson was a member of the Bainbridge Methodist Church, and was foremost in all of its work, being particularly interested in its Sunday school.

He is survived by his widow and their two children.

"IN MEMORIAM" RESOLUTIONS.

Dr. W. D. Miller.

THE officers and executive committee of the American Dental Society of Europe, upon learning of the decease of Professor W. D. Miller, passed the following expression of regret:

WHEREAS our honored and beloved fellow member. Dr. WILLOUGHBY DAYTON MILLER has been suddenly removed by death, the officers and the executive committee of the American Dental Society of Europe desire immediately to express to his afflicted family and to the dental profession the sympathy and the deep sense of personal bereavement which every member of our society feels in this irremediable loss.

K. A. DAVENPORT, *President*.
J. W. GALE, *Secretary*.

DENTAL COLLEGE COMMENCEMENTS.

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

THE twenty-fifth annual commencement exercises of the College of Dentistry, State University of Iowa were held in the University Armory, Iowa City, Iowa, Wednesday morning, June 12, 1907.

An address was delivered by the Hon. William Howard Taft, LL.D., Secretary of War.

The degree of Doctor of Dental Surgery was conferred by the dean, William Suits Hosford, B.A., D.D.S., on the following graduates:

Daniel Bettice	Herbert Wayne Lee	Elza Rollin Stealy
Guy Cameron Black	Chester Raymond Leech	Harry Holdridge Stevens
Cecil Earl Carl	Adelbert Lockard	Joe Ray Swartzendruber
Frank James Check	Chester Arthur McElderry	Roy Salem Towne
Walter Clarence Davis	Earl Angus McLeod	Lumir Frank Vane
Harley Dale Duncan	Kenneth McMartin	Roy Booth Washburn
George Dudley Graham	Glen Ward Miller	Charles Richard Weir
Emmett Amos Greene	Edward L. Moravec	Ira Heydon Wells
Charles Lee Heit	Walter Sewel Nye	Charles William Wilkinson
John Dexter Hemingway	Roe Ernest Percy	James Matthew Wilson
Elise Jorgensen	Clarence Walker Robertson	Harry T. Wood
Robert James Joynt	Arthur Chester Shouse	Winfield Scott Ziegler
Walter C. Klaffenbach	Clyde Homer Stauffer	

ATLANTA DENTAL COLLEGE.

THE annual commencement exercises of the Atlanta Dental College were held in the Grand Opera House, Atlanta, Thursday evening, April 25, 1907.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Robert Toombs Allen	Thomas Conway Garlington	James D. Moreland
Louis Watson Alston	Sheppard Mitchell Griffin	Norman Leslie Overstreet
Sydney Atkinson	Daniel Luther Hall	David Boykin Patton
D. Spence Aycock	Edwin Lawrence Head	Harry Linwood Pearce
Spurgeon H. Barnett	William A. Holbeck	David Randolph Phelps
Lester Lee Bennett	Claude Newton Hughes	Hamilton A. Ratcliffe
Burnett Gilliard Black	Roy Marshall Huntley	Jonnie B. Robson
Claudius Elmer Blandenburg	James Robert Jackson	Samuel Frank Ross
Verner Leigh Brown	James Wilson Johnson	James Allious Rutledge
William H. Brown	Hugh Ward Kah	Herman G. Sheets
Joseph Fletcher Bryan	Thomas L. Keetchersid	Henry D. Smith
Cecil G. Butt	M. Wickliff Laurence	Julian G. Spence
Walter Chandler	Forney Montgomery Lawrence	Kirby W. Starr
Arthur Jackson Clement	Gilbert Ichabod Lewis	Lowe Stillman
Walter Lee Cook	Robert Herman Little	William Maxwell Thebaut
Alva Simpson Cromartie	Harry Grady McElvany	Robert B. Thompson
Warren Cornelius Duke	Spencer Francis McJunkin	Robert L. Thompson
Harlan Parker Edmonds	Ernest W. McKenzie	Junius C. Thomson
Lawrence Edward Ethridge	William Caswell Mason	Charles Spurgeon Williams
Romulus R. Folger	William H. Mitchell	Alonzo J. Wimberly

SOCIETY NOTES AND ANNOUNCEMENTS.

NOTICE FROM N. D. A. COMMITTEE ON THE HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathetically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based

upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 550, leaving 150 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUEMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. McMANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.

BURTON LEE THORPE, *Sec'y*, St. Louis, Mo.
CHAS. McMANUS, *Ch'man*, Hartford, Conn.

ARMY DENTAL CORPS.

DENTAL Surg. Charles J. Long, to proceed to the Philippine Islands, on transport sailing from San Francisco about September 5, 1907, instead of the first available transport after July 19, 1907. (Aug. 8, W. D.)

Leave for one month, to take effect about August 24, 1907, is granted Contract Examining and Supervising Dental Surg. John S. Marshall, Army General Hospital, Presidio of San Francisco. (Aug. 8, D. Cal.)

Dental Surg. John H. Hess is transferred from the Division Hospital, Manila, to the General Hospital, Presidio of San Francisco, Cal., for treatment. (July 1, Phil. D.)

Dental Surg. Emmett J. Craig from further duty in the Philippine Division, and will proceed not later than September 25, 1907, to Fort Leavenworth for duty, relieving Dental Surg. John D. Millikin, who will proceed to Fort Sheridan for duty, relieving Dental Surg. John A. McAlister. The latter will proceed to San Francisco and take the first available transport sailing for the Philippine Islands, for assignment to duty. (Sept. 13, W. D.)

Dental Surg. F. Homer Wolven to proceed at the proper time to San Francisco and take transport to sail from that place on or about November 5, 1907, for the Philippines for assignment to duty. (Sept. 13, W. D.)

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

AT the annual meeting of the National Association of Dental Examiners held in Minneapolis, Minn., the following officers were elected: Frank O. Hetrick, Ottawa, Kans., president; F. A. Shotwell, Rogersville, Tenn., vice-president for the South; T. R. Henshaw, Middletown, Ind., vice-president for the East; J. J. Wright, Milwaukee, Wis., vice-president for the West; Chas. A. Meeker, Newark, N. J., secretary and treasurer.

Committee on Colleges—J. G. Reid, Chicago, Ill.; L. L. Barber, Toledo, Ohio; G. S. Todd, Lake City, Minn.

Joint Conference Committee—J. F. Dowsley, Boston, Mass.; R. D. McIntosh, Monet, Mo.; J. A. Hall, Collinsville, Ala.

Joint Tabulating Committee—Alphonso

VOL. XLIX.—81

Irwin, Camden, N. J.; J. F. Dowsley, Boston, Mass.; J. G. Reid, Chicago, Ill.

Joint Committee on National Council of the N. A. D. E. and N. A. D. F.—H. C. Brown, Columbus, Ohio; Geo. E. Mitchell, Haverhill, Mass.; H. W. Campbell, Suffolk, Va.; J. D. Patterson, Kansas City, Mo.; H. W. Morgan, Nashville, Tenn.; Wilbur F. Litch, Philadelphia, Pa.

Dental Corporations Committee—J. R. Wallace, Louisville, Ky.; Chas. A. Meeker, Newark, N. J.; C. P. Pruyn, Chicago, Ill.

Credentials and Membership Committee—C. H. Oakman, Detroit, Mich.; J. H. Wallace, Omaha, Neb.; W. G. Mason, Tampa, Fla.

Resolutions Committee—T. J. Barrett, Worcester, Mass.; W. H. Collins, Vermillion, S. D.; W. C. Dalrymple, Ogden, Utah.

Publication Committee—J. E. Chase, Ocala, Fla.; C. Stanley Smith, Cincinnati, Ohio; H. B. Purl, Kirksville, Mo.

Committee for Promoting a System of Uniform Examinations—T. F. Turner, St. Louis, Mo.; E. D. Brower, Lemars, Iowa; A. L. LeGro, Three Rivers, Mich.

Committee on Contracts and Accommodations—Chas. A. Meeker, Newark, N. J.

(The first mentioned in each case is the chairman.)

CHAS. A. MEEKER, *Sec'y.*

ANGLE SCHOOL OF ORTHODONTIA ALUMNI SOCIETY.

THE second annual meeting of the Alumni Society of the Angle School of Orthodontia will be held in St. Louis, Mo., December 12, 13, and 14, 1907.

MARTIN DEWEY, *Sec'y.*

Argyle bldg., Kansas City, Mo.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION.

THE next meeting of the Boston and Tufts Alumni Association will be held at the Westminster Hotel, Copley sq., Boston, October 9, 1907, at 6 p.m. Papers will be read by Dr. John H. Worthen, Concord, N. H., and Dr. Levi C. Taylor, Hartford, Conn.

ROBERT W. CRAM, *Sec'y.*

739 Boylston st., Boston, Mass.

NORTHERN ILLINOIS DENTAL SOCIETY.

THE twentieth annual meeting of the Northern Illinois Dental Society will be held at Rockford, Ill., October 16, and 17, 1907. You are cordially invited to attend.

A. M. HARRISON, *Sec'y*,
Rockford, Ill.

NORTHEASTERN DENTAL ASSOCIATION.

THE thirteenth annual meeting of the Northeastern Dental Association will be held in the city of Portland, Me., at the Hotel Lafayette, October 16, 17, and 18, 1907. Preparations are being made for a valuable and instructive meeting.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

THIRD, FOURTH, AND FIFTH DISTRICT (N. Y.) DENTAL SOCIETIES.

JOINT MEETING.

THERE will be a joint meeting of the Third, Fourth, and Fifth District Dental Societies of the State of New York held in Schenectady, N. Y., on October 15 and 16, 1907, at Red Men's Hall.

A. S. MOORE, *Sec'y Fourth Dist.*,
159 Jay st., Schenectady, N. Y.

NEW JERSEY STATE DENTAL SOCIETY.

At the thirty-seventh annual meeting of the New Jersey State Dental Society, held in Asbury Park, N. J., July 17, 1907, the following officers were elected: Walter Woolsey, Elizabeth, president; Frank G. Gregory, Newark, vice-president; Chas. A. Meeker, Newark, secretary; Henry A. Hull, New Brunswick, treasurer. Executive Committee—Frank J. Gregory, Newark; Harvey Iredell, New Brunswick; Chas. H. Dilts, Trenton; W. A. Jaquette, Salem; Wallace F. Naylor, Somerville. Membership Committee—Oscar Adelberg, Elizabeth; Wm. H. Gelston, Camden; Henry Fowler, Harrison; Wm. T. Thompson, Asbury Park; Thomas F. Martin, Rahway.

CHAS. A. MEEKER, *Sec'y*.

MARYLAND BOARD OF EXAMINERS.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates November 6 and 7, 1907, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. For application blanks and further information apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island State Board of Registration in Dentistry will hold its next meeting for the examination of candidates at the State-house, Providence, November 6, 7, and 8, 1907, beginning each day promptly at 9 A.M. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than November 1st.

W. S. KENYON, *Sec'y*,
301 Westminster st., Providence, R. I.

ILLINOIS BOARD OF EXAMINERS.

THE annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the College of Dentistry, University of Illinois, northwest corner of Honore and Harrison sts., beginning Monday, November 4, 1907, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university, or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses

the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee of twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license, must accompany the application.

Address all communications to

J. G. REID, *Sec'y*.
1204 Trude bldg., Chicago, Ill.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 6, 7, and 8, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before November 1, 1907.

By order of Commission.

GILBERT M. GRISWOLD, *Recorder*,
783 Main st., Hartford, Conn.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held in Minneapolis, at the Dental Department of the State University, on Tuesday, November 12, 1907. All applications must be in the hands of the secretary by October 29th, accompanied by the fee of ten dollars.

Examinations begin at 10 o'clock sharp on the following subjects: Anatomy, physiology, chemistry, materia medica and therapeutics, metallurgy, pathology, oral surgery, orthodontia, operative and prosthetic dentistry. The practical examination consists of the preparation of a cavity and the making

of a gold filling or the preparation of the root and the making of a crown, or both, for a patient supplied by the board. All instruments and materials necessary to perform the required operations must be brought to the examination by the applicant. A diploma from a recognized college must be shown.

Any further information will be gladly furnished by

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

ARIZONA BOARD OF EXAM- INERS.

THE Board of Dental Examiners of Arizona will meet at Phoenix, Ariz., November 11, 12, and 13, 1907, for the purpose of holding examinations. The fee—twenty-five dollars—should be in the hands of the secretary twenty days before date of the meeting.

For further information, address

J. HARVEY BLAIN, *Sec'y*,
Box 524, Prescott, Ariz.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held December 3, 4, and 5, 1907, at Masonic Banquet Hall, Manchester, N. H.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

NEW JERSEY BOARD OF REG- ISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Statehouse, at Trenton, N. J., beginning Monday, December 9, 1907, and continuing through the 10th and 11th. Practical operating and practical prosthetic work will begin 8 A.M. Monday. Photograph and preliminary credentials must accompany the application.

For full information address

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

NEBRASKA BOARD OF EXAMINERS.

THE next meeting of the Nebraska State Dental Board will be held at the State-house, in Lincoln, November 18, 19, and 20, 1907. All applications for examination must be in the hands of the secretary at least five days before this date. For any further information address

C. F. LADD, *Sec'y.*
Lincoln, Neb.

MASSACHUSETTS BOARD OF REGISTRATION.

A MEETING of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., October 23, 24, and 25, 1907.

Candidates who have applied for examination will report to the secretary, Wednesday, October 23, at 10 A.M., at Harvard Dental School, North Grove st., and come prepared with rubber dam, gold, plastic filling materials, and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished. The board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, ma-

teria medica, therapeutics, physiology, bacteriology, anesthesia, chemistry, and metallurgy, and will be held at Civil Service Rooms, State-house, from Thursday, October 24th, at 10 A.M., until Friday P.M., October 25th.

All applications, together with the fee of twenty dollars, if first examination, must be filed with the secretary of the board on or before October 16th, as no application for this meeting will be received after that date.

Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary as above.

Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the secretary. Temporary licenses are never granted. The fee for third and subsequent examinations is five dollars.

G. E. MITCHELL, *Sec'y.*
Haverhill, Mass.

COLORADO BOARD OF EXAMINERS.

EXAMINATIONS granted to holders of diploma only. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any states. Examination first Tuesday of June and December, at Denver.

HOWARD T. CHINN, *Sec'y.*
307 Mack bldg., Denver, Colo.

UNITED STATES PATENTS PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1907.

August 6.

No. 862,588, to L. E. ROWLEY. Dental pliers.
No. 862,604, to R. L. ANDERSON. Dental separator.
No. 862,780, to W. H. WOODS. Dentist's cabinet.

August 13.

No. 862,881, to C. S. CASE. Dental appliance.
No. 863,006, to J. H. SPRINGLE. Handpiece for dental engines.

No. 863,478, to W. W. WILLIAMSON. Dental engine.

August 20.

No. 864,054, to A. ABRAMS. Tooth-brush.

August 27.

No. 864,465, to J. HOOD. Dental filling.
No. 864,569, to G. H. SHANNON. Dental plugger.

THE DENTAL COSMOS.

VOL. XLIX.

NOVEMBER 1907.

No. 11.

ORIGINAL COMMUNICATIONS.

A NEW AND ACCURATE METHOD OF MAKING GOLD INLAYS.

By W. H. TAGGART, D.D.S., Chicago, Ill.

(Read before the New York Odontological Society, at its anniversary meeting,
January 15, 1907.)

FOR a number of years I have looked forward with the hope that some day I might meet, on their own ground, the men I have learned to know so well—some of you personally, others through your writings, and still others (the larger number) through your discussions of the papers read before your society.

After studying your individual ways of expressing yourselves, I have learned to know most of those who enter into the discussions of your society papers, for each of you puts his individuality into his extemporaneous talks, as he does into his manner of dressing, or walking; and one of my delights in reading our monthly journals is to try to guess whose remarks I am reading, before I look at the name, and by this means you would be surprised to learn how well I know

some of you. But the larger number I meet tonight for the first time, and I hope you will not remember some of my ways of expressing myself, for if you do I fear that most of my paper will be old to you. I say "most of my paper" advisedly, for, gentlemen, I come to you tonight with something *new*—something which in my fondest hopes for improved and more practical methods of filling teeth I had not thought to realize.

THE GOLD INLAY HITHERTO.

It never occurred to me that I would be the one to devise those radical changes which I knew must come in order to make any decided progress; for you will have to admit that our chief improvement in the line of gold inlay work in the last ten years has come more from

our increased dexterity, due largely to our experience, than from any novelty of methods.

Of course, individually we have improved, and our gold inlay of today is much more sightly and mechanically more correct than it was five years ago; we have changed one method for another, and by a gradual growth the making of the present gold inlay was evolved; but the same foundation was being builded upon: a matrix, either gold or platinum, was burnished to the cavity, or to a cast of the cavity, and this was filled with solder or gold scraps; or a swaged articulating surface soldered to this matrix. All this has been the practice, and with very gratifying results; but we have reached the limit of improvement by these methods, and something radical must come or we will cease to improve the gold inlay.

One method I have the pleasure of showing you tonight; if by chance in my enthusiasm I should say too much, and thus spoil my concentration, or if I should say the same thing too often, remember I am imbued with the same idea that runs through that old religious song, "I love to tell the story, because I know 'tis true."

Before I present to you my special method for gold inlay work, I wish to make a few remarks on some of the underlying principles which pertain to all kinds of inlays, gold or porcelain.

UNDERLYING PRINCIPLES IN INLAY WORK.

There is no doubt in my mind that the inlay principle for filling teeth has come to stay; chiefly because it is a better tooth-saver. I have never advocated any method in dentistry solely because it was easier, but if it be better, and incidentally is easier, I am heartily in favor of it, and this seems to be the position the inlay principle takes in my practice. When I say it is a better tooth-saver, I know I am treading on the sacred ground of some who believe, first, last, and always, in the gold foil

filling, and who point to a number of records of fifty years of good service for foil fillings; but in their eagerness to stand by an old friend they fail to state the thousands of just as perfect fillings as the fifty-year-old ones, that have not lasted three years, not because they were not mechanically correct, but because of the low-grade tooth-structure on which the filling was built. No two substances such as gold and tooth-material can come in actual contact, consequently there is always a chance for capillary attraction to take place; but in the case of the long-lived filling it makes no difference about capillary attraction because the tooth-structure is good; in the short-lived gold filling, however, the structure is faulty, and along with this is a bad environment, and then capillary attraction takes place and bad results follow. In case an inlay is put in a tooth of faulty structure the capillary condition does not exist, consequently the mechanical cause for leakage is no longer present, and the tooth-structure, in spite of its environment, resists decay. I have had inlays come out, and have also seen some mighty poor ones, but I have never yet seen an inlay fail from recurrent decay.

An inlay is an honest filling; it is either in the tooth, and saving it from decay, or, it is in the appendix.

I will have nothing to say on *cavity preparation* except this: If a cavity be a suitable one for a gold inlay, no steel tool should be used in its preparation; carborundum stones of suitable sizes and shapes are far preferable. The inlay is put into cavities with beveled margins, and no steel tool can compare with a carborundum in forming these margins. I say suitable carborundum wheels should be used, but they are not on the market, so I pass around for inspection wheels mounted and shaped for this purpose, and also I pass a file such as I use to shape these points, filing them to shape while revolving in the handpiece. As this inlay process can be made practically painless by use of these stones, why use a steel tool? The difference in comfort to the patient between the two is as great

as between a pneumatic tire and an old-fashioned farm-wagon wheel.

A year or so ago Dr. Poundstone, of Northwestern University Dental School, read a paper on cements, and by a series of elaborate experiments showed that the cement took up all of the space occupied by the 1/1000 inch platinum used as a matrix, and consequently there was no use in having a matrix thinner than this gage, as the cement had to occupy the 1/1000 of an inch anyway, whether the matrix was thinner or not. I knew some of my inlays stood away from the margins considerably more than this, and some of them a great deal less, so I immediately combated his idea, and have since incorporated my own explanation in all of my inlay work. It is this:

The grains of cement pile up on top of each other the same as so much sand does; now, when direct pressure comes on these grains, those which can get out of the way do so, but the others remain one on top of the other, and the harder the pressure the less apt they are to assume a new position.

Take, for example, the method of the molders in a foundry. They throw up an irregular pile of sand, and on top of this they put a molding-board; do they then put direct pressure on this to embed it? No. They could put their whole weight on it, and it would embed but a little; but they give it a rubbing movement, so as to push one grain of sand off from another, and in this way they get it to seat itself.

Take the bricklayer. Does he put the mortar down, and the brick on top, and put his weight by direct pressure on it? No, he taps it from side to side and end to end, in order to have the grains of sand roll off each other.

Now, apply this principle to inlay setting. Many are in the habit, as soon as the inlay is approximately to place, of putting direct pressure with an instrument or with a wooden wedge, and by so doing placing the cement grains in a condition where they cannot roll one away from the other, but are on top of each other, and will not allow the inlay to be seated, which to my mind is the

cause for an excessive cement line between the inlay and the cavity in what would otherwise be a close-fitting inlay. Now, in the gold inlay I would avoid this by using a mallet and a hard-wood stick, and go forward and back across the corners, and down the center and back again, and keep this up for quite a few seconds.

In the case of a smaller approximal porcelain inlay, I would press the inlay approximately to its seat, and then take a piece of linen tape, about a foot long and wider than the inlay, and draw its full length against the inlay; this absolutely wipes all the excess cement away and seats it as well as direct pressure can do. Now for our principle:

At this stage take a very narrow tape, viz, one-sixteenth of an inch wide, and use this as you would a polishing strip, going from end to end of the inlay, as you would in polishing a gold inlay; anyone who has not tried this or a similar method will be surprised at the excess cement which squeezes out, because the grains of cement have been allowed to roll away from one another.

The dissolving of the cement line I have never found to be a serious element in the life of the inlay, as the depth to which it dissolves is only equal to the width of the line, consequently it does not leave exposed any vulnerable point, and no leakage can take place under the inlay, as capillary attraction as a force has ceased. But in a good foil filling this same amount of defective margin would be fatal to the life of the filling.

THE NEW METHOD.

What I now present to you as my process for making gold inlays under the title "A New and Accurate Method of Making Gold Inlays" should have had a more comprehensive name. The title should have included bridge work and gold plate work, for I believe it will be the coming method for making partial gold plates and bridges as well as inlays. The title also should have included some information in regard to the time consumed, for this is one of its greatest

points. By this process I can make gold inlays of the most complicated character in from thirty to forty minutes, inlays which have always taken me from three to four hours to make. In fact, there is not an inlay which I show you tonight that has taken more than thirty-five minutes to make. This, of course, does not include the cavity preparation, or cementing to place, which is the same with this inlay as with any other; the thirty-five minutes is the time actually consumed in manufacturing the inlay.

The process is as follows: After the cavity is prepared, a piece of special wax which has been filtered several times through fine filter paper, in order to remove every trace of foreign matter, is warmed and then pressed well into the wet cavity with the fingers, and the patient is allowed to bite into this in any and all directions, as in mastication. This gives an imprint of the opposing cusps in the wax. The wax is now raised out of the cavity just enough to unseat it, and show that it is not sticking to the cavity. At this stage the wax is chilled slightly with ordinary hydrant water, and the excess wax is trimmed away. Always during this shaping process be sure to keep the wax at an easily workable temperature.

In other words, make a wax inlay the exact shape you wish the finished gold one to be. Any artistic effects put on the wax at this stage will save time in the end, because wax is much more easily carved than gold, and by carving with instruments lubricated with perfumed vaselin one can soon become expert in making wax inlays. If the cavity is so situated as not to have an adjoining tooth to help hold the wax in place while carving, the whole mass of wax can be chilled and carefully lifted from the cavity, and then, keeping it thoroughly chilled under the hydrant water, it can be carved, can be carried back to the cavity any number of times, thus being carved out of the mouth, and the final adapting of the margins is quite easy.

We now have a perfect wax inlay made of a material which has no foreign matter in it. Into this wax inlay [illustrating]

a sprue wire is set by warming it sufficiently to melt it to the wax. The wax inlay with its sprue attached is now fastened to the lid of the flask, which is also a crucible mold. The inlay is then wholly embedded in an investing material, and when this has hardened the lid is removed from the flask, and the sprue wire comes with it, which now leaves a crucible with a hole leading to the wax inlay. The flask is put over a flame, and slowly heated up, and the wax is absorbed into the investing material, and leaves a mold the exact shape of the wax inlay. You see there is no separating of the flask to get the pattern out, as is always done in any other kind of molding.

The flask is now put into the molding machine, which has a nitrous oxid blow-pipe flame for melting the gold, and a compressed-air attachment for forcing the liquid gold into the mold, under a pressure of from 25 to 40 lb. to the square inch. The nitrous oxid flame is almost a necessity, as it is only by this flame that the gold can be made liquid enough to cast and cool without shrinking.

When the nitrous oxid flame has heated the gold much beyond its melting-point, the lever is quickly brought down, the flame is automatically switched away, and the compressed air is automatically thrown in on top of the liquid gold, which, of course, must go into the mold under heavy pressure. Sometimes cracks have developed in the investing material, and the gold was forced into these minute crevices in sheets as thin as tissue paper, showing how liquid the gold may become.

The actual time consumed in forcing the melted metal into the air-tight mold under this heavy pressure is probably but a fraction of a second, but the success of the whole process depends on this speed.

I have kept pace with all former molding processes, and find that by the time the metal is melted and poured into the mold by gravity, it has become chilled enough to be thick, and not in a thin liquid form necessary for fine casting. My process, as I will show you, takes advantage of every fraction of a second

of favorable conditions, and by having this heavy pressure on top, with no possible chance for gold or air to escape, the liquid gold is forced in; and by liquid gold I mean gold in a boiling state—a great number of degrees beyond its actual melting-point. While it is in this freshly molded condition the pressure is maintained for a few moments, in order to allow the molten gold to thoroughly congeal; either this continued pressure prevents the gold from contracting, or the amount of expansion in the hot mold is equal to it; at any rate, the filling fits.

Some have suggested that being composed of the purer and high-grade metals there is less expansion and contraction than with low-grade metals, which I think is true in a measure, but there must be some other reason, for we all know that the coefficient of expansion and contraction is different in each metal, and yet metals—gold, silver, copper, brass—all fit the cavity perfectly. My theory is this: The molten molecules of metal are forcibly thrown into the mold and held there, and consequently are not allowed to rearrange

themselves, as they would do if not under pressure.

This being a purely descriptive paper, it has taken but a few moments to describe the process, and as my ability as a teacher, if I have any, does not consist in writing text, if you will permit me I will repeat, in my own language and by the use of my hands, this description, so that, as I hope, you can all grasp it. [At this stage Dr. Taggart gave a minute and detailed demonstration of the whole process, carving, flasking, heating, and casting. (See also page 1162.)]

And now, gentlemen, in conclusion I will say that this is no careless man's process; but I do say that I can take the most ordinary workman in this audience, and if he be a man who will obey instructions to the letter and not allow his own ideas to creep in from the start, I can show him in a half-hour how to make gold inlays better in every way than the most skilled workman can do by any other process to date; and if allowed to instruct the already skilled man, he will make such an inlay as he never dreamed could be made. Gentlemen, I thank you.

IS THE CEMENTED FILLING THE FILLING OF THE FUTURE?

By F. T. VAN WOERT, M.D.S., Brooklyn, N. Y.

(Read at the Jamestown Dental Convention, Norfolk, Va., September 11, 1907.)

I APPRECIATE the honor of having been selected as one of the essayists of this meeting, and hope the matter I present will prove of interest and value, also that it may bring out a discussion which will establish a conversion to what I believe to be the coming practice for the restoration and salvation of teeth.

I realize the many difficulties to be encountered, the most important of which is the prejudice on the part of the profession against abandoning what has been the keystone to the arch of our science—gold foil. Personally, I believe

that gold foil has seen or is now seeing its last days, and that we are at the dawn of a new era.

In looking back over a personal experience of over thirty years, it seems strange to find that nearly all efforts have been made in the direction of perfecting a method, and not of changing things by the adoption of a new one, and that now, when one which is practical is presented, it does not meet with unanimous indorsement by becoming the general rather than the exceptional practice. This may seem a broad state-

ment, but it will take very little investigation to convince you that it is true.

RELATIVE TOOTH-SAVING PROPERTIES OF FILLING MATERIALS.

In my college connections I found that the majority of students, from the first day of their freshman year to the final one of their senior, seemed to have but one goal, namely, perfection in gold manipulation. Their masterpieces at graduation have been the restoration of contour with gold foil. An amalgam filling would receive only passing praise, while one of gold seemed to be a thing of beauty and a joy forever.

For a gold filling, whether it be of cohesive or non-cohesive foil, a tooth must be so prepared that it will support and protect the filling for its own salvation—which effect in many cases is but for a limited time, even when from the hands of the most expert. I remember standing beside the late Dr. Marshall H. Webb for several hours to watch the insertion of two large contour fillings in the upper central incisors of our dear old friend now gone, Dr. Orville E. Hill. When they were completed, I breathed a prayer that some day I might be able to accomplish a like result—for I assure you they were a work of art. But, sad to say, they lasted less than one year. To be sure that is an extreme case, but at the same time I believe the percentage of failures with gold foil to be greater than that with any other material at our command. In any event, satisfactory results in the use of gold foil are obtained only at the hands of those operators who are its masters, and unfortunately there are not as many of these as there should be, if its use is to be continued.

Amalgam has been the greatest friend the dental profession has ever known, the greatest godsend to the public, and, I am sorry to say, the most abused of any substance given us with which to preserve human teeth. With it one does not have to more than half try in order to get a result that will last at least long enough to free one from censure

for lack of skill. When properly inserted there is no question about the ability of amalgam to save and make comfortable any tooth, and while the chief objection to its use is its appearance, yet this has become true of gold. The use of amalgam will probably last for many years, if not for all time, and its employment cannot be superseded entirely by the cemented filling—at the present status, at least.

Gutta-percha will in all probability hold its own as a temporary stopping, or for use in very small cavities which are protected. Such has been its particular value for many years.

Cement will become the standard when protected by a covering of porcelain or gold.

I cannot believe that any of the base metals will be used to any extent, as there could be no object other than the cost of material to recommend them, and this is so small a matter that it is hardly worth consideration. On the other hand, there are many serious objections to their use.

THE CEMENTED FILLING—PORCELAIN.

My conversion to the cemented filling can only be explained, and I hope sustained, by a detailed account of the methods necessary to produce results which would warrant such a conviction.

The following figures will show in what proportion this matter has grown upon me: In 1904 there were 317 cemented fillings inserted for my patients; in 1905, 391; in 1906, 498; and to July 1st of the present year, 430, against less than one dozen gold foil operations for the first six months of the present year.

When Dr. Jenkins first gave up the use of other materials for that of porcelain exclusively I feared the result; but now, in addition to my appreciation I feel under deep obligation to him for his courage in setting us an example.

Personally, I do not follow his teachings in full, but I do use his porcelain almost exclusively for filling operations—not for crown work, for the latter a high-fusing body being my preference,

because a rigid and permanent matrix that prevents warping under such a high temperature is used. I am sure that, when properly fused, Jenkins' or Brewster's gold matrix body is of ample strength for any filling where porcelain is indicated. The success of a porcelain filling is dependent more upon a correct occlusion and the care exercised in fusing, than upon any other factors in its construction.

That porcelain is not more universally used is due to several causes, the first and foremost being the difficulty in securing a matrix of such correct adaptation to the cavity as to serve the purpose which it is intended to fulfil. Second, the absence of a method by which the lines of contour may be followed with a fair degree of accuracy. Third, difficulty as to color. Fourth, liability to repeated failure, due to the fusing and occlusion, as stated above. All these difficulties, I hope to show, can be overcome.

The old fear of these fillings falling out because of the disintegration of the cement has been, I think, a mistake, and on that point the following remarks by Dr. I. N. Broomell at the February meeting of the New York Odontological Society (*Cosmos*, June 1907, p. 616), present the most concise and logical explanation that could be offered. He says:

"If lactic or other acid solutions are the chief agents concerned in bringing about the destruction of the cement, they can only do so as acids, which they will cease to be when they are neutralized through the chemical changes which are bound to take place within the confines of the sulcate-like joint through inactivity of its contents. My belief is, therefore, that a cemented filling never fails through a dissolution of the cement."

There is much evidence that cemented fillings have stood the test of many years, and the number of years during which crown and bridge work has held sway goes far to prove this. That teeth poorly crowned under adverse circumstances will last for many years with comparative comfort is another evidence in favor. I have seen cemented fillings that

were ground to shape last from ten to twenty years, and have had the pleasure within the last three months of examining one of porcelain which I myself inserted over fourteen years ago, and found it just as good as when first placed in the tooth. I remember several cases reported at our local meetings where gold fillings had been displaced in finishing and were cemented at the same sitting, lasting for several years. Thus we see that the dawn of this new era is due rather to methods which make the cemented filling practical, than to a new theory.

DR. TAGGART'S GOLD INLAY SYSTEM.

The introduction last January of Dr. Taggart's gold inlay, and the instrument for producing it, removes the last barrier to the fortifications of that vast army of gold foil knights, and they must surrender and take up arms in defence of the new king to whom they will swear allegiance; and if under him they are as courageous and zealous as under the old, we may hope to draw near and possibly surmount or destroy the last wall which conceals from the world the ideal filling.

The procedure which has given me results that are responsible for my present position is inferior, theoretically, to that advocated by Dr. Jenkins and a number of others, and it required a practical demonstration to convince me of that fact. And it is that experience which has eliminated charts, drawings, or lantern slides from this paper. In the past I have listened to elaborately illustrated articles on this subject, but without conviction that the impression method for porcelain fillings was the best; yet it took less than half an hour with our good friend Dr. Taggart to prove to me that it was so; hence my practical demonstration which is to follow, at the pleasure of your committee.

CAVITY PREPARATION.

Either method requires a properly prepared cavity. This would naturally

include the formation of the same, but I prefer to separate these subjects, because there are a number of theories advanced by prominent writers relative to cavity formation any of which it would be safe to adopt, as they are all based on the principle that a cemented filling should be so formed as to be self-supporting; in other words, the cavity should be so shaped that when the opposing teeth are brought in contact with the filling they will force it against the cavity seat without any rocking or actual misplacement.

Under the head of cavity preparation I mean the removal of all carious matter and of such other pathological conditions as would interfere with cavity formation. To some this may seem a ridiculous distinction, but when no less a personage than the distinguished Dr. Jenkins forms his cavities first, and after making the matrix finishes by removing the carious tissue, I think I am justified in making it. There is no question of Dr. Jenkins' ability to obtain the best results in this way. Few have the keen perception and sound judgment to support them that he has. My deductions are based on the capabilities of the general or average practitioner, and it is to the latter that I hope this paper will prove of value, and help him over some of the high bumps, so to speak.

The only objection to the removal of all carious matter before burnishing the matrix or taking an impression is that it generally results in undercuts which interfere with its draft. This is very easily overcome by temporarily filling such places with Gilbert's or some other temporary stopping. A thin coat of vaselin eliminates any possible adhesion or other source of interference in operations such as the following: Take for example two cavities, one being anterior approximal of the first molar, either upper or lower, and the other posterior approximal of the second molar—a very difficult location in which to secure a proper matrix, and particularly by the burnishing method, which would require extensive separation, and if the cervix were below the gum line a compress

should be worn for two or three days, to obtain the best results. The impression method eliminates practically all of this. A thin wedge worn overnight will give ample space, as only enough space is required to permit of clearance for a piece of 32-gage metal, and for this I use platinoid, which has many advantages over others, as I will show and explain better in my clinic. A strip is cut about one-quarter wider than the tooth, the corners being rounded to prevent cutting or scratching. It is then bent at right angles at a point to allow sufficient to pass just below the cavity margin for the posterior approximal cavity; for the anterior the long part is bent up and back parallel at a point which leaves enough to cover the crown of the tooth.

THE IMPRESSION.

A sufficient amount of Detroit modeling compound is now prepared. I specify this make of compound because it is the best that I have been able to find for the purpose, and when in thin cakes, as they have furnished it for me lately, by slightly warming in water it is easily cut with an ordinary table knife into narrow strips, which puts it in the most convenient form for ready use. The metal tray should be warmed sufficiently in a Bunsen or alcohol flame to make it adhere perfectly to the compound, which should now be shaped so that it will pass into the cavity, and then cooled, when it is ready for final warming to take the impression. It is this procedure which is most important in obtaining a satisfactory result. If the compound be heated so that it is all one temperature the impression will be nothing like the cavity, but if that surface which comes in contact with the tooth be soft enough to stick to it, and that which is next to the tray be hard, it has enough resistance to force the soft portion to a perfect adaptation of all the parts, and minimizes the time required for its setting or cooling. When it is removed a perfect counterpart of the cavity should be the result; if not, another im-

pression—or, in fact, several—can be taken in a few minutes, in less time than a matrix could be made in the mouth. The same procedure is applicable to cavities in any location, with the exception that the metal tray or cup must be formed in accordance with the requirements of the location. These conditions can only be explained by a demonstration.

THE AMALGAM DIE.

After securing a satisfactory impression the surplus metal should be cut away, leaving only that which is in direct contact with it; then a suitable quantity of plaster is mixed, of a consistence to stand when placed in the form of a cone on a glass or other suitable slab. The impression, metal side down, should be forced deeply enough into the plaster to leave a strong wall around it. After it is hard, trim the top to leave a depth sufficient for the amalgam which is to form the die; here is where many fail, and their failure is usually due to an effort to fill the impression as one would a cavity in a tooth—that is, by getting rid of the excess of mercury and burnishing with considerable pressure. This the compound will not stand, but it will stand a good even pressure over its entire surface, and if the amalgam be worked into place very soft, enough of the excess mercury can be removed by pressure upon the whole mass when the impression is completely filled; the result will be a very sharp, clear reproduction of the tooth-cavity.

ADVANTAGES OF THE METHOD.

The porcelain filling made from such a die—if it fit the die—will surprise many, and what will be more surprising is the fact that in many cases it does not fit, and that very often in a location that would escape your notice in the tooth. In the days when porcelain fillings were confined to surfaces where all margins were exposed it was very easy to detect these defects, but when they are placed

in obscure positions it is sometimes impossible to find some of the minute imperfections that are bound to occur; even if it were, what is the remedy? A long, tedious, and nerve-racking operation to secure a new matrix, which in turn is liable to be defective, if not made so in the fusing; while with the impression method it is a simple matter to make a new filling, or several, before the return of the patient.

Another great advantage is where there is difficulty with colors in the restoration of centrals or laterals. I have often been obliged to combine two or three colors and make several fillings for a satisfactory result, all of which is done without the knowledge of the patient, and, more important than all, without the nervous strain necessary were each filling made in a matrix obtained direct from the tooth.

Still another and extremely important consideration: What provision has been made or can be made toward securing a proper occlusion by the burnishing method? Personally, I know of none. On the other hand, where an amalgam die is used, a mush-bite is secured, the die placed in position and articulated as for a crown, bridge, or other operation of the kind. The matrix is filled and the porcelain is fused to an approximation of the shape, leaving the margins exposed so that they may be readjusted to the die after it is placed in it. Then the balance of the body should be spatulated to the proper form, but in excess, and after drying it is carved to suitable articulation and given the final fusing.

THE FUSING.

As stated before in this paper, the last two operations are the most important factors in the construction of porcelain fillings, and I have found that all bodies, whether high or low fusing, should be fused at as low a temperature as possible to obtain the most strength. I have heard it stated that the S. S. White 2300° porcelain will fuse on pure gold if given time enough. This I do

not know, but I know that Jenkins' or Brewster's gold matrix bodies can be fused in less than one-half minute, but the result is a porous, brittle mass of no value, while the same material fused at a temperature that would require three or four minutes gives a very dense result which takes a polish after grinding that would make it hard to detect that it had ever been placed on the wheel. In porcelain fillings three or more fusions are required, and if the first be brought to a perfect fuse, by the time the last one is finished the first has been ruined. Should this be a filling having to sustain much stress, the entire filling is ruined. To overcome this, the first layer should be placed in the center of the lowest point in the matrix and fused to a very dull biscuit, at which point the greater part of the shrinkage has taken place. The second should be the same—except, of course, that each layer should be brought nearer the margin and contour—and the final one fused to a smooth but not glassy surface. Such a filling will possess all the strength that is possible to obtain from the body used.

THE SELECTION OF COLORS.

In the exposed surfaces this is a very important matter, yet one that I think is easily managed. First it must be remembered that the cement when placed under a porcelain filling brings to light all the color there is in it, and makes it appear darker than the one selected. It is necessary to make provision for this, and I know of no better way than to select a color as near that of the tooth as possible, and then add enough plain white to make it about two shades lighter than that required. I know of no fixed rule by which this can be done, so it is largely a matter of experiment and experience with each operator, very much the same as in the combination of several colors.

CEMENTS.

Several cements are on the market that are eminently satisfactory for the

setting, and but one precaution should be observed in selecting from them—that is, to adopt one color, and preferably cream white; any attempt to better the shade of the porcelain with cement usually results in failure. The exception to this rule is in cases where the enamel is thin enough for the cement to show through in the anterior teeth; in such cases the colored cements are invaluable, but should be used in connection with the white.

My best results in cementing porcelain fillings have been obtained by the following method:

First etch the surface to which the cement is to adhere, then cut with a knife-edge disk irregular grooves around the bulbous portion of the filling, boil in a strong solution of sodium bicarbonate, and rinse in 95 per cent. alcohol. The soda is to prevent continued action of the acid, and the alcohol to free it from any fatty matter that may be acquired in the handling. That the action of hydrofluoric acid is continued for several hours unless this precaution be taken is easily proved by a thorough washing of the case after etching with brush and water, and setting it aside for a day, or overnight. The result is a thick coating of a chalk-like substance covering the entire surface where the acid has been applied; this is easily removed with a small brush. Should the filling be inserted before the removal or elimination of this substance, which of course spoils or prevents the adhesion of the cement, the result will be the loss of the filling within a few days.

The cement should be mixed to a creamy consistence, carefully spatulated to thoroughly incorporate the powder into the fluid and make it perfectly smooth; and with a fine-pointed instrument it is worked into all the undercuts of both cavity and filling; then the filling is placed in position and ligated with a heavy waxed ribbon floss, the surplus cement removed, a thick coating of sandarac varnish spread over the whole, and the patient is dismissed with instructions to remove the ligatures and varnish at the end of two hours.

THE COMBINATION OF GOLD AND PORCELAIN.

This has been recommended and the necessary procedure advised by Dr. Walter Wolfgang Bruck, instructor in the Dental Institute of the Royal University of Breslau, and has proved of great value in those cases where cavities were so large that matrices made from the thinner golds are sure to warp in the fusing of the body. He recommends the use of 34 to 36 gage pure gold plate for the matrix, which does not require an investment to protect it and can be placed into the cavity and the margins reburnished to a perfect adaptation just before the final fusing. That portion of gold which covers the bulbous part of the inlay is removed by cutting a groove around it with a knife-edge disk, leaving a pure gold gasket around the entire margin of the filling to be polished and burnished after it has been cemented and perfectly set. The only disadvantage or objection, if such it may be called, is the fine line of gold to be seen around them. I have inserted many fillings of this kind in the molars, in particular, with eminently satisfactory results to the patient and myself.

Cemented gold fillings I believe to be advantageous where extensive restoration of contour is required in the distal portions of the bicuspid or any of the surfaces of the molars. It would be absurd for me to waste your time and my own in dilating upon the technique of construction in this work, as you are to have two papers dealing with the subject exclusively.

I have, however, clinical matter in this line which I shall take great pleasure in showing you, and which I hope will carry

conviction that gold foil as a filling material, as stated before, is seeing its last days.

The instruments and equipment necessary for the best results in any part of the procedure before mentioned are comparatively few and inexpensive. A Brewster screw press, two or three suitable glass or porcelain slabs, artists' camel-hair brushes from No. 1 to 9, a few small spatulas, varying in shape, a good electric furnace without pyrometer, a Taggart gold casting machine with sufficient stock, will equip one to produce results which will be extremely satisfactory to the operator and his *clientèle*.

CONCLUSION.

In conclusion: It has been my aim in this paper to give you in the simplest manner possible practical facts, purposely omitting any reference to the historical status of the subject and without attempt to analyze for cause and effect, because it is a physical impossibility to incorporate them with justice to the convention and myself. There are many considerations any one of which would make a paper in itself; for instance, a question of occlusion. If according to the new school of orthodontia malocclusion is a prominent factor in many of the ills that human teeth are heir to, an entire session could be profitably utilized in consideration of the same.

Finally, I want it distinctly understood that I am not depreciating the value that gold foil has possessed in uplifting the standard of our profession in the past, or the skill of the many who use it, but am entering a plea for the adoption of a very much easier, more humane, and practical method to succeed it.

THE PURPOSES AND ACCOMPLISHMENTS OF MODERN ORTHODONTIA.

By RODRIGUES OTTOLENGUI, M.D.S., LL.D., New York, N. Y.

(Read at the Jamestown Dental Convention, Norfolk, Va., September 11, 1907.)

WHAT is "modern orthodontia"? By this term I do not mean to differentiate between one school and another; the modern orthodontist is not necessarily a member of any clique, or class, or clan. Modern orthodontia is the orthodontia of today in contradistinction to the art of yesterday, just as modern dentistry differs from the dental science of twenty years ago. I must dwell a moment upon this point. There may be some who will argue that the differences between the today and the yesterday in orthodontia are so great that the modern orthodontist is a newly created being, the product of entirely new teaching and the practitioner of a totally new art. They will point out the radical differences between the past and the present in proof of their contention. I shall myself indicate some of these radical differences, but I shall speak of them merely as stages of progress, not as factors in invidious class distinctions. Similar and quite as conspicuous differences between the past and the present may be found in other fields. Indeed, the most radical innovation upon a long-established dental method is the evolution, now nearly completed, in the art of filling teeth. The mechanically secured metallic filling is slowly but surely being abandoned in favor of fillings retained by cementation. The chief work of this carefully planned dental convention is the exploitation of this idea. This is modern dentistry, and modern orthodontia has made no greater departure; yet I do believe that there is a line of demarkation in orthodontia which is quite as important, quite as radical.

ORTHODONTIA OF THE PAST.

In order that we may fully comprehend the period which marks the beginning of a new era in orthodontia, let me briefly sketch its early days. Long before the word orthodontia was coined we spoke of "irregularities of the teeth" and the "correction of irregularities," or, otherwise, "the straightening of teeth." I shall not probably reach a better point at which I may tersely differentiate between the old and the new in orthodontia. Formerly the straightening of teeth was the primary aim of the operator; now it is but an incident in the everyday work of the orthodontist. Yesterday, the tooth-regulator tirelessly worked to place teeth in a symmetrical alignment; today, the orthodontist aims to restore occlusion, thus establishing normal functioning of the dental organs. In the past, teeth were placed where they would look pretty; in the present, they are moved so that they will be the most useful.

In the early days the mother noticed when the teeth were shed that her baby's new teeth were "coming in crooked," and in alarm she hurried to her dentist to know what was to be done; and at that time the mother instinct was wiser than the dental knowledge of the day, for the dentist usually advised delay and "giving nature a chance," not realizing that delay gives nature no chance whatever.

At the age of twelve or fourteen, however, the patience of parents usually ended, and dentists were compelled by importunity to "do something." Then what occurred? To this point I request your particular attention. In such pre-

dicaments, the dentist usually made models and studied the case. He studied the case as a problem by itself—a case to be treated, and if possible corrected, exactly as though there never had been another like it in the world. He made his diagnosis in accordance with what he felt capable of accomplishing, and he designed appliances to aid him in his work. If he made a conspicuous success he proudly wrote a description of his management of the case and published it, with illustrations of his fixtures. The early history of orthodontia is crowded with articles of this sort—individual cases, treated in accordance with individual ideas and with appliances specially designed for each particular case. The modern orthodontist glances through these articles and feels sorry for those early workers, struggling without knowledge to accomplish results which they scarcely comprehended themselves. Yet these men were the pioneers, and without the foundation which they laid the edifice of modern orthodontia never could have been erected.

While, as I have said, special devices were made for each case, those men who developed a fondness for the work, and thus attracted to their care any great number of cases, very soon noticed certain features common to many cases; and from that time on appliances were recommended that would do certain work in any mouth—as, for example, fixtures for widening the arch; the use of bands cemented to the teeth; the expansion arch wire; jack-screws; spring wire appliances, etc. And as these grew in number, so-called “systems” began to arrive. Of the systems we have several which bear the names of those who have devoted themselves each to the elaboration of one. But the advent and perfection of none of these systems has made that great impression upon orthodontic practice to which I have alluded as establishing a demarkation between the old and the new ways. True modern orthodontia dawned with the announcement by Angle of his classification of irregularities, which since then has come to be a standard for both diagnosis and prognosis.

THE ANGLE CLASSIFICATION.

Just as many practitioners observed that a majority of cases require so-called widening of the arch, Angle noted that many other features were common to many mouths. By closely studying the models in his own and other cabinets he finally evolved a classification in which he places all known irregularities in three great classes; of these there are divisions and subdivisions. Though at first it may seem to the student that this Angle classification is complex, it really is exceedingly simple. At the same time it is so important, being as it is the rock and foundation of all correct diagnosis, that I shall here take time to expound it to you, with the aid of the lantern. [The essayist here threw on the screen examples of each division and subdivision in the Angle classification.]

FORMS OF MALOCCLUSION NOT CLASSIFIED.

In addition to the three great classes there are two other forms of irregularity to which I will allude. As I have already pointed out in exhibiting the slides, in class I the mesio-distal relations of the molars are normal. In class II the lower molars are distal to normal, and in class III the lower molars are mesial to normal. In the subdivisions we have instances where the molars are normally related on one side and abnormally placed on the other. But cases have been noted where the lower molar may be distal to normal on one side and mesial to normal on the other. Such a case, of course, falls outside of the Angle classification. Nevertheless, a knowledge of that classification, with the habit of utilizing it as a basis of diagnosis, quickly determines for the orthodontist the line of treatment to be followed. Observing that on one side the molar is distally related, he sees that it must be moved mesially into normal occlusion; on the other side he finds the molar mesially placed, and it therefore must be carried distally; and, studying both sides, he sees that the movement of the lower arch must be all in one di-

rection, around its arc. This movement is accomplished by using intermaxillary elastics, placed reversely on the two sides.

The other rare abnormality of which I shall speak is that occasionally alluded to as "double protrusion." I have unfortunately had four such cases in my practice, all coming within the conditions of class I of Angle. Indeed, I should find it difficult to even imagine a double protrusion of either class II or class III. And this is exactly why these awful cases are so difficult—a statement which brings me to a momentary consideration of so-called protrusions. A protruding upper jaw, in a class I case, is generally accompanied by wide spaces between the teeth, and, the molar relations being correct, the treatment is usually simple, demanding merely the reduction of the prominent teeth into a proper arch. Occasionally a class I case may have a narrowed vault and a protrusion of the anterior teeth; here, again, the protrusion may be corrected by moving the upper teeth into proper arch alignment. In both cases the lower jaw may be utilized as anchorage for intermaxillary force while reducing the upper protrusion. If, however, there be an anterior protrusion of the lower arch also, the utilization of intermaxillary force would not be so simple. Indeed, it has been asked, How may we use intermaxillary elastics to force the upper jaw backward, coincidentally with similar use of similar force to move the lower jaw backward? At first glance the proposition seems ridiculous; yet I believe that intermaxillary force may be advantageously utilized in double protrusion—though this is not a fit time to discuss it. The point at which I am aiming is that the protrusion of both jaws places a case in an entirely different category from protrusions, or so-called protrusions, of one jaw.

In class II cases the apparent protrusion of the upper is largely magnified by the retrusion, or lack of development, of the mandible. A study of the profile shows that the fault lies largely in the false position of the chin and lower lip. Properly treated, at the proper age, very little reduction of the so-called protru-

sion is needed, provided the lower can be moved to true relations. The same is true of class III cases, the seeming lower protrusion disappearing with the development and forward movement of the upper arch and lip. In both instances the profile is suffering from a lack of development and consequent lack of balance, as I shall show with slides later. Moreover—and please bear this fact in mind—it is the undeveloped part rather than the seemingly over-developed part that mars the profile.

EXTRACTION INDICATED IN DOUBLE PROTRUSION?

With the double protrusion exactly the reverse is true; the features are marred by the over-development of both arches. And at this point I wish to introduce an argument for the future careful consideration of orthodontists. In class II and class III cases true balance may be established, in the vast majority of cases, without extracting any teeth; indeed, it would be hard to properly correct such cases after extraction. The exceptions are so few that they fall into the list of true deformities, or monstrosities, rather than mere abnormalities. In such cases, also, there is invariably a departure from type in the profile. How is it with the double protrusion? I have pointed out that the single protrusion—if I may be pardoned for using such a term—is mainly due to lack of development of one jaw, while the double protrusion is an over-development of both jaws. Again, the single protrusion is a departure from the type for the profile. In regard to double protrusion, I believe that a close study of such faces would show that the double protrusion is often an approach to type rather than a departure—that it is an atavistic throw-back of ancestral origin. This is important if true. For example, should we find a double protrusion accompanied by proportionate narrowing of both arches, the face being likewise narrow, we should be entirely right in attempting a restoration of normal arch width and shape—thus reducing the protrusions and restoring fa-

cial balance—without extraction of teeth. If, however, we should meet a case with normal arch form and relations, nevertheless showing marked double protrusion, with the face normally wide, what interference to undertake would be a grave question. Such a condition is a normal type, and is counted a deformity only because it is rare and therefore different from the faces about us. Rather than disturb such a normal occlusion it might be excusable to extract teeth in order to reduce the protrusions, though it should be remembered that such treatment would never change such a face to a normal type. Fortunately such cases are extremely uncommon, and for all practical purposes may be placed within the list of deformities and monstrosities—where, and where only, is extraction excusable.

ETIOLOGY AS A FACTOR OF TREATMENT.

The modern orthodontist likewise makes a study of the causes which produce or invite irregularities of the teeth. It may be truly said that etiology has always been considered, but never until within recent years has it so materially influenced modes of procedure. For example, I cannot here go deeply into the question of the causation of cases of class II and class III, but I may say that since we have concluded that these apparent protrusions are really in a large measure ocular delusions, and that the patients are in fact suffering from a lack of development of either the upper or the lower arch, we have come to see the necessity for earlier intervention. Referring back to the earlier part of this paper, I remind you of the mother who visited her dentist when her child's teeth began to erupt "crooked." Today she would be advised that immediate intervention is imperative. Indeed an arrest of development can often be distinguished prior to the loss of any of the deciduous teeth, and slight forces exerted at such periods will so invigorate the parts that development may be resumed, complete growth may result, and a perfect denture may erupt where, without

interference, a quite extensive abnormality would surely have supervened.

Much has been said and written about adenoids as a cause of irregularities. The common argument is that nasal obstructions—whether from adenoids or deflected septa, hypertrophied turbinates, or polyps—compel mouth-breathing, which in turn molds the arches to become narrower than normal. It appears to me that the most important relation of nasal obstructions to irregularities has not received sufficient attention: However much mouth-breathing may affect the shape of the arches—and this has yet to be demonstrated with anything like exactness—I believe that the more important fact is that from improper breathing the child receives a disproportionate share of oxygen, and that from a lack of this element nutrition is impaired. When it is remembered that the alveolar processes are subsidiary bones, and that they are produced only as needed, we can readily conceive that a poorly nourished child may not be physically able to build bone as rapidly as the erupting teeth demand. Hence we have teeth erupting into arches which never grew, rather than arches which have been narrowed. However this may be, the modern orthodontist recognizes now the need of a more thorough comprehension of the etiology in order to cope to the best advantage with the abnormalities that abound.

SUMMARY.

To sum up, I would state that the *purposes* of the modern orthodontist are—First: To recognize the advent of dental abnormalities as early as possible, that treatment may be to a large degree preventive. Second: In the presence of a lack of development of the jaws, to stimulate growth along normal lines. Third: To so move all the teeth of both jaws that normal occlusion may be restored. And the modern orthodontist believes that the nearer he comes to normal occlusion, the more certainly will he achieve the best possible facial results, and likewise the best arrangement of the teeth look-

ing toward their prophylactic preservation.

In the title of my paper I also allude to the *accomplishments* of the modern orthodontist. In connection with this phase of my topic I have the pleasure of presenting to you a number of lantern slides showing the work of various men in all parts of the country. The point is that whereas in the past a few men with their systems have achieved fine results, such results were nevertheless confined to a very limited number. Since

the advent of the Angle method of diagnosis based upon a classification, however, an increasing number of specialists are accomplishing similarly fine results—all working along similar lines with simple apparatus.

[The essayist then showed on the screen cases from the practices of various orthodontists, including three cases, one of each class, from his own practice. In all, the treatment of twenty-eight cases was illustrated, by means of over one hundred lantern slides.]

ANTISEPTIC TREATMENT OF PATHOLOGICAL CONDITIONS OF THE ORAL MUCOUS MEMBRANE.

By H. C. FERRIS, D.D.S., Brooklyn, N. Y.

(Read at the annual meeting of the Massachusetts Dental Society, Boston, June 5, 1907.)

IN order to intelligently consider this subject we must first study the anatomy of the parts which we are to treat, their physiological functions, blood supply, nerve supply, and secretions. The mucous membrane of the oral cavity is divided into six distinct regions, those of the cheeks, lips, gums, tongue, roof, and floor. The mucous membrane lining the cavity of the mouth consists of two parts, the epithelium and the tunica propria; beneath the latter, and forming the deeper part of the mucous membrane, is the submucosa.

The epithelium of the mouth is a thick, stratified squamous epithelium, the most superficial cells being scale-like or horn-like. The cells are arranged like those in the epidermis, are columnar in form, and contain very little pigment.

The tunica propria is a somewhat dense feltwork of interlacing connective-tissue bundles, interspersed with elastic fibers. It penetrates the epithelium in the form of cylindric or conic papillæ, which differ in length according to the

variation in the thickness of the epithelium. As the mucosa is usually thickest in the lips, gum, soft palate, and uvula, the papillæ are accordingly of the greatest length in these parts. The tunica propria passes into the submucosa so gradually that a positive line of demarcation cannot be established.

The submucosa consists of a bundle of fibrous connective tissue with but few elastic fibers. This structure is somewhat loose in texture, and is loosely attached to the underlying periosteum. Over the major portion of the gums and the entire hard palate, the submucosa is attached to the bones of the mouth through the medium of the periosteal covering. It is in this loosely constructed tissue that the glands of the mucous membrane are situated. These are for the most part branched, tubular, mucous glands. Besides adipose tissue in the form of groups of fat-cells, striped muscular tissue is present in the submucosa. In some parts of the mouth this tissue forms a conspicuous portion—

namely, in the orbicularis oris, also in the soft palate, uvula, and pillars of the fauces.

The blood supply to the mucous membrane of the mouth is principally distributed in two systems, the larger vessels to the submucosa and the capillaries to the tunica propria. The large vessels break up and send a dense network of capillaries through its substance and to the numerous papillæ which extend into the epithelium. Numerous veins ramify through the superficial part of the tunica propria. The lymphatics form two networks, the submucosa giving place to the coarser vessels, while the fine parts are distributed to the tunica propria.

In the submucosa the medullated nerve fibers form a wide-meshed reticulum, from which numerous primitive fibrillæ pass to the tunica propria, where they terminate or continue as non-medullated nerve fibers and penetrate the papillæ of the epithelium, forming networks. If it were not for the viscid, poorly soluble mucoid secretions of these glands this tissue would be susceptible of infection as well as the source of toxemia, as its vascularity proves. Toxic drugs having the ability to penetrate these mucoid secretions have to be reduced in their strength two-thirds for safety, thus proving this premise.

THE SALIVA.

The secretions of these glands unite to form the saliva, which is a colorless, inodorous, tasteless, somewhat stringy and frothy liquid, which serves the purpose of aiding in the acts of mastication, deglutition, and digestion. In 1000 parts there is found by weight:

Water	995.20
Ptyalin	1.30
Mucin	} 1.62
Epithelium	
Fatty matter	?)
Sulfocyanids	0.06
Alkaline chlorids	0.84
Di-sodium phosphate	0.94
Magnesium and calcium salts....	0.04
Alkaline carbonate	traces

Its active ferment is ptyalin, which

converts starch into dextrin and sugar. Its sulfocyanids and alkaline chlorids and magnesium and calcium salts are compounds which are receiving a due amount of consideration at this time by many of our scientific workers.

A study of this secretion during pathological alterations such as tuberculosis, actinomycosis, catarrhal stomatitis, ulcerative stomatitis, gonorrheal stomatitis, interstitial gingivitis, alveolar abscess, tonsillitis, glandular fever, diphtheria, scarlatina, etc., affords a field for the oral surgeon which is worthy of his best effort. The normal quantity secreted is 1500 grams, or about forty-eight ounces, but this is subject to great variation. An increase in this amount is frequently noted in pregnancy and in various neurotic conditions, in tabes, bulbar paralysis, in inflammatory diseases of the mouth, in dental caries, following the administration of pilocarpin, in poisoning with mercury, acids, and alkalis. The quantity is diminished in all febrile conditions, in diabetes, and often in nephritis. The effect of psychic influences upon the secretions of saliva as well as on other glands is well known, an increase or decrease in the flow being produced under various conditions. The acid reaction of saliva has been noted in various intestinal febrile diseases, and notably in diabetes. Some authorities claim that the reaction of the saliva is alkaline even under pathological conditions, but your essayist believes that this opinion is based upon litmus-paper tests, which are inaccurate, as he finds that by a 1:40 normal sodium hydrate test an acid index of from $\frac{1}{2}$ to 6 is obtained in the majority of pathological conditions. Among the qualitative changes may be mentioned an increase in the amount of urea, which has been repeatedly observed, especially in nephritis. Bile-pigment and sugar have not been found in the saliva.

The object in drawing out the consideration of the subject to this length is to better understand that we are not working upon a masticating machine hung on to the human body, which an-

imal and vegetable decomposition compels us to keep clean, but upon a cavity of the utmost importance in the physical system. When its physiological, chemical, and mechanical functioning is interfered with, the subject must necessarily suffer. I believe that the time will come when the general practitioner of medicine will appreciate that the dental surgeon is indispensable in the treatment of the vast majority of constitutional disorders, owing to the possible ill effects of auto-intoxication arising from a surgically unclean oral cavity; even already his assistance is being duly appreciated. We are shown by careful experiment that the bacteria of the oral cavity multiply enormously in the presence of disease in any of the mucous tissues.

GERMICIDAL ACTION OF THE SALIVA.

We are also aware that the saliva in its normal state has a decided bacteriological action. This germicidal power will kill the staphylococcus aureus, the streptococcus pyogenes, the micrococcus tetragenus, the typhoid bacillus, and the cholera spirillum, when present in moderate numbers. The diphtheric bacillus, however, is more resistant, and may survive for twenty-four to forty days. It has been found as a matter of fact that the bacilli may be demonstrated in the throats of some individuals who have passed through an attack of diphtheria for several weeks after all the clinical symptoms have disappeared. The diplococcus of pneumonia is even said to grow well in saliva, although it rapidly loses its virulence.

It is believed that this germicidal power is due to the presence of sulfocyanate and alkaline chlorids, for in their absence we find that disease runs rampant. The presence of potassium sulfocyanate is detected by reducing 2 ccm. of saliva with 2 ccm. of distilled water and adding 5 minums of iron perchlorid, giving a dark brown color. The recognition of ammonium chlorid is obtained in the same dilution with the addition of silver nitrate, which will precipitate the chlorids, the reaction taking place

according to this equation: $\text{AgNO}_3 + \text{NaCl} = \text{AgCl} + \text{NaNO}_3$. The silver chlorid thus formed is insoluble in nitric acid.

If it be true that the antiseptic action is due to these chemicals—and our clinical experience shows a marked and almost immediate improvement when potassium sulfocyanate is given internally with an alkaline purge to increase the fluidity of the blood and stimulate the kidneys to functionate normally, thereby assisting the metabolism—it is worthy of our consideration. The physiological reaction of this drug—potassium sulfocyanate—is alkaline, and in small repeated doses it increases the pulse and is used extensively in the treatment of rheumatism, gout, gastritis, etc. The improvement in local conditions under this treatment is evident, inasmuch as the tissues susceptible to caries will be continuously flooded with the chemical. We may thereby inhibit the growth of the acid-producing bacteria by dissolving the gelatinous plaques and rendering the medium less favorable for the growth of bacteria.

ANTISEPTIC SPRAYS.

To further assist nature in this effort to overcome the attacks of bacteria, and to sterilize the oral cavity during surgical operations, your essayist recommends the treatment with antiseptic sprays which are both chemical and mechanical in their action. By the use of potassium in combination with iodine we have a non-irritating, non-caustic alkaline. It has a penetrating power toward albumin which is even greater than that of mercuric chlorid, as it destroys the spores as well as the parent cells. It can be used in greater strength upon these delicate tissues without toxic influences resulting and without destroying metallic fillings. It is a germicide and stains and fixes the plaques so that they may be visible. After having fixed and stained the plaques which appear on the surfaces of the teeth, we may remove them by the use of a starch solution, which takes them up as a myriad of sponges

would. The potassium iodid, which dissolves the albumin, forms with the starch an iodid of starch, which floats off the surface in a flocculent precipitate. To decolorize this mixture and further dissolve the oleaginous matter, a solution of sodium carbonate may be employed, which further frees the surfaces by saponifying the fats. In the treatment of gum diseases such as ulitis or interstitial gingivitis, or in the preparation of a patient for any surgical operation, these formulas are used:

I.

R—Iodini, \mathfrak{m} xxx
Potassii iodidi, \mathfrak{m} xix
Aque dest. ad q.s. $\frac{3}{4}$ iv. M.

Sig.—To be used in spray under high pressure at the temperature of 98° F.

II.

R—Starch, gr. xxxviii
Aque menth. pip., $\frac{3}{4}$ iv
Oleum menth. pip., \mathfrak{m} xx M.

Sig.—To be used at the temperature of 115° F.

In making this compound, mix the first two ingredients and let stand for five minutes, then boil for five minutes, then add the flavoring.

III.

R—Sodii carb., gr. xxxviii
Aque gaultheria, $\frac{3}{4}$ iv
Olei gaultheria, \mathfrak{m} xxx. M.

Sig.—To be used at the temperature of 115° F.

The chemical reaction of this is shown in this equation: $KI + 6I + 3Na_2CO_3 = KI + 5NaI + NaIO_3 + 3CO_2$. Bacteriological experiments by Dr. T. H. Dexter, pathologist of Seney Hospital, Brooklyn, New York, has proved the antiseptic value of this treatment, and a clinical experience is the warrant of your essayist for recommending it to your consideration.

PYORRHEA ALVEOLARIS.

As a corollary to this subject, I wish to introduce a technique and a set of prophylactic instruments in the treatment of pyorrhea alveolaris. The gum

tissues are dried with a hot-air syringe after placing cottonoid pads over the salivary ducts and sponging them with adrenalin chlorid, this causing the contraction of the arteries and reducing the tendency to hemorrhage and the liability to the absorption and consequent toxic effects of the anesthetic ointment, which is composed of:

IV.

R—Cocoa butter, 3 iij
White vaselin, 3 v
Cocain, gr. xiv
Menthol, gr. xxiv
Oil peppermint, \mathfrak{m} x
Chloretone, gr. ix
Phenol, \mathfrak{m} ij M.

Sig.—Apply on gum tissues after drying.

The above is applied with the finger to the gums after a second drying; these tissues are dried again with warm air, and by a process of osmosis the anesthetic and antiseptic are carried into the epithelium and mucous glands. These glands become paralyzed in their effort to supply additional secretion in response to the reflex call to allay the inflammation caused by the irritation of the serumal tartar and additional attacks of bacteria.

The pyorrheal pockets are filled with the same mixture, introduced by means of a collapsible tube fitted with a small platinum point and allowed to remain five minutes before beginning the scaling operation. The instruments are constructed in the form of a drag file, made to fit the curves of the surfaces to be worked upon. Their efficiency will be appreciated upon using them with a pull motion. They must be used as a fulcrum, and not by pressing them against the tooth, for being made of semi-hardened steel, they easily break.

Following their use and sometimes preceding it, the following formula is recommended to be used by the patient as an antiseptic stimulant, used hot to increase the circulation and to tone the overworked glands to their normal action after the local irritating cause has been removed and the teeth splinted.

V.

R—Hydronaphthol,
 Menthol, āā gr. xxx
 Oil gaultheria,
 Oil cassia, āā ʒ iv
 Alcohol, ʒ x
 Tinct. capsicum, ʒ j
 Distilled water ad q.s. ʒ xx. M.

Sig.—Teaspoonful to half-glass hot water five times daily.

I wish to emphasize in my closing words that this method of antiseptic

treatment is not introduced with the idea that it will take the place of mechanical cleansing with wood points and pumice as suggested by Dr. D. D. Smith of Philadelphia, but merely as an adjunct to assist the tissues while overcoming the effects of the disease.

I am indebted to the following gentlemen for many of the scientific facts used in the preparation of this paper: Charles E. Simon, M.D., I. Norman Broomell, D.D.S., T. H. Dexter, pathologist, and H. L. Quick, Jr., B. A., chemist.

PREVENTIVE MEDICINE.

By FREDERICK P. GAY, M.D., Danvers, Mass.

(Read at the annual meeting of the Massachusetts Dental Society, Boston, June 6, 1907.)

IT is indeed an honor to have been asked to address so representative a body of your profession. The subject chosen for this talk, "Preventive Medicine," is so broad in scope as almost to appal one who wishes to present something concrete in a few minutes.

The subject might handily be divided into *theoretical preventive medicine* and *applied preventive medicine*, according as it is dealt with, in actuality or in discussion, by the laboratory worker or the practitioner. It is far from my desire to minimize that participation in the great work of the prevention of disease which is the burden of the one who administers to the judiciously chosen individual the remedy which has been placed in his hand by the experimenter; but, as I am a laboratory worker primarily, it is this phase of the subject which I may with confidence venture to present to you.

Progress in the prevention of a disease has depended on, first, an increased knowledge of the disease itself as regards its cause, its method of propagation, and its effect; secondly, a knowledge of the means of defense possessed to a greater

or less extent by the organism attacked by the disease. This knowledge has been gained not only by observation of the manifestations of a disease as it occurs spontaneously in man or in animals, but more particularly by the evolution of the idea of experimentation, which aims to reproduce a disease under conditions particularly advantageous for its study.

SYPHILIS AS AN EXAMPLE.

I might consider historically how one disease after another has been checked or practically eradicated, and I might consider the concomitant evolution of such laboratory branches as bacteriology, hygiene, and pathology, but apart from a repetition of such phases of the subject as are known to you, there would remain a very superficial conception of whatever new I might be able to impart. For this reason it has seemed better to consider in detail the recent advances which have been made in our knowledge of the cause, evolution, and prevention of a single disease, and I have chosen one of primary interest to humanity—namely, syphilis.

On account of its prevalence and dire-

importance, no disease since the days of the ancients has been more attentively studied than syphilis, and yet it is surprising how many important phases of the disease have, until recently, escaped us. It has frequently been said that a knowledge of syphilis comprises a knowledge of the practice of medicine, and when we consider its inter-relation with other diseases, the statement is not unreasonable. It has been widely accepted that such diseases as tabes and general paralysis are terminal infections due to syphilis—parasyphilitic affections as the French call them; and yet the exact relation of these diseases to syphilis has never been proved, owing to an ignorance as to the exact nature of the contagion of syphilis.

THE MICRO-ORGANISM OF SYPHILIS.

Many attempts have been made to find the cause, bacterial or otherwise, of syphilis, but until 1905 all such attempts were fruitless. In the early part of that year Schaudinn and Hoffmann described the finding of a delicate spiral organism in primary and secondary lesions of the disease, to which they gave the name of *Spirocheta pallida*. This organism is corkscrew-like in shape, and resembles, to some extent, certain spiral organisms which have been found normally in the mouth, but differs enough from all similar organisms for the purpose of diagnosis. It is a very delicate organism, being only one-fourth of a micron thick at most, and in length from four to fourteen microns. It stains with difficulty, and has not yet been grown on culture media.

Immediate attention was drawn to the spirocheta pallida, from the fact that once the method of staining the organism was found by its discoverers, its presence in the typical lesions of syphilis was universally corroborated. It was found, moreover, in no other disease. Further observations determined the finding of the organism in the blood of secondary syphilitics in small numbers, and even in the tertiary gummata of the disease.

Furthermore, it may be found in large numbers in sections from hereditary syphilis stained with silver nitrate. That the organism is in reality the cause of syphilis is further assured by the fact that it may be found in the experimental syphilis induced in animals.

SYPHILIS INDUCED IN SIMIANS.

Ever since the idea of transmitting diseases to animals for the purpose of studying them, attempts have been made in vain to produce syphilis in the ordinary laboratory animals. Finally, Klebs in 1879 produced what looked to be a chancre in an ape by injecting fragments of a chancre from man. This observation was confirmed in a few instances by others, but the general impression was that only in certain rare instances are monkeys susceptible to human syphilis. In 1903 Metchnikoff and Roux took up the subject more thoroughly, and found that not only may a chancre be produced by injecting the smaller monkeys with human syphilitic virus from mucous patches or chancre, but that if the higher anthropoid apes—the chimpanzee by preference—are injected with such virus, they develop not only a chancre, but subsequently typical secondary symptoms—papular rash, mucous patches, enlarged lymph glands, and the like. In short, these large monkeys acquire a disease in all respects like syphilis in man, and the disease may further be transmitted from one animal to another.

As a result of the experimental studies in apes by these French authors, many new ideas have been gained concerning the causal relation of the spirocheta pallida to the disease, the evolution of the disease itself, and finally certain measures tending to its prevention. As I have already stated, the spirocheta pallida can be found in the lesions in apes, where it occupies a position about the bloodvessels, as in man. The organs in human syphilis vary in their power of producing syphilis in apes in accordance with the relative numbers of spirochetæ present in the part used for injection;

thus, gummata and blood in which there are few organisms are the least advantageous to be employed as virus; mucous patches and the initial sore are the best. The period of incubation in the chimpanzee before the production of a chancre is found to average thirty days; between the chancre and the appearance of secondaries, from nineteen to sixty-one days may elapse.

PROTECTIVE EXPERIMENTS OF METCHNIKOFF AND ROUX.

It has been pretty generally accepted for human beings that one attack of syphilis protects against another. In monkeys, likewise, the evolution of one chancre prevents the infection with another. It was the aim of Metchnikoff and Roux, from the beginning of their studies, to find some means of vaccination against syphilis; that is, some means of protecting a normal individual by giving a modified disease and thereby producing an active immunity, as is the current method in smallpox. These authors found fruitless—in the case of the syphilitic virus—all ordinary attempts to diminish its strength and thereby modify the disease which it would produce. Syphilitic virus heated to 48°C. will not produce the disease, and the injection of such killed virus produces no immunity in the animal treated with it. It was found, as has been mentioned, that although smaller monkeys react to syphilitic products with a chancre, they develop no secondary symptoms as do the chimpanzees; that is, they are much less susceptible to the virus.

The chancre, however, in the smaller monkeys appears much sooner than in the large apes; that is, the rapidity in the evolution of the disease would seem to vary in inverse relation to the severity of the disease. If a given human syphilitic virus is passed from one small monkey (*Macacus rhesus*) to another, it is found that the time necessary to produce a chancre diminishes, until after the fifteenth passage or so the virus has become "fixed"; that is, further passage will not reduce the incubation period

necessary for chancre formation. If such a fixed rhesus virus is injected into the chimpanzee, which is so highly susceptible to the original human virus, no ill effects beyond a local induration and slight glandular enlargement are noted. No secondary symptoms follow the inoculation of this modified virus, and more important still, it is found that chimpanzees so treated subsequently give no reaction at all to fully virulent human virus; in other words, they are perfectly vaccinated against syphilis. The possible application of such a vaccination to human beings is obvious. In two cases, at least, it has been shown that human beings who were inoculated, one accidentally and one voluntarily, with virus which had passed through monkeys, showed no more violent reaction than the chimpanzee vaccinated as has just been outlined. The further proof that such individuals are immune to human syphilis is as yet lacking, but there would seem to be little doubt that they are.

The application of such a method of vaccination seems somewhat problematical. Metchnikoff and Roux have suggested that prostitutes might thus escape the almost inevitable contagion incident to their trade. It hardly seems likely, however, that these unfortunates start on their downward path with their eyes open to the dangers that beset them. The vaccination of children in certain districts of Russia, where syphilis is frequently spread throughout entire communities by contamination from playmates with the hereditary disease, seems more feasible.

As a further advance from their studies of ape syphilis, Metchnikoff and Roux find that local inunctions of calomel ointment, even several hours after inoculation with the virus, will prevent the disease. In several instances the production of a chancre has been avoided by this treatment in human beings after contact with a proved syphilitic.

SEARCH FOR A SPECIFIC CURATIVE SERUM.

Even before it was known that syphilis could be produced in animals, efforts

had been made to find a specific curative serum for the disease by immunization of such refractory animals as horses, cows, and dogs. The sera of such animals treated by many injections of the blood of syphilitics has proved of no service in the treatment of syphilis in man. It is now well known that animals which do not take a disease are usually very poor for the purpose of producing a specific serum. It may well be that the blood of vaccinated apes might have a distinct curative effect in human beings; at any rate it has recently been shown very conclusively, by a delicate biological reaction, that the blood of men and of apes who have recovered from syphilis contains distinct anti-bodies to the syphilitic virus. The first desideratum is to have at hand the spirochetæ which are the cause of syphilis, and as soon as these organisms can be grown on artificial media, a long step forward toward the production of a curative serum for the disease will have been taken. An organism similar to the spirocheta pallida—the *Spirocheta refringens*—has recently been grown in collodion sacs in the peritoneal cavity of rabbits.

SUMMARY.

I have run over, then, very briefly the recent knowledge which has been gained

in the study of syphilis by methods of experimentation and study which the laboratory has developed. The cause of syphilis has been proved beyond a doubt, and by means of the experimental production of the disease in apes we have learned much as to how this causative spirocheta effects the lesions which typify the disease as we know it. Many new points of value have been brought forward, such, for instance, as the fact that gummata are really infective, since they contain the spirocheta pallida in small numbers, and will produce the disease in apes. The vaccination of apes by means of a virus fixed by passage from lower monkeys has been assured, and its application to human beings seems feasible. The production of a specific curative serum is hinted at, at least, by recent studies.

As you see, in the disease which I have chosen for discussion, preventive medicine has by no means said its last word. And, apart from the inherent interest which clings to this protean disease, it was also largely due to the fact that the end is not yet, that I wished to bring it to your attention. For it is, after all, the method of attack, the experimental idea by means of which such a problem is taken up by the modern workers in preventive medicine, that I wished to indicate to you.

NITROUS OXID AND OXYGEN: ITS POSSIBILITIES AND PRACTICABILITY AS A GENERAL ANESTHETIC.

By C. K. TETER, D.D.S., Cleveland, Ohio.

(Read at the thirty-ninth annual meeting of the Pennsylvania State Dental Society, Pittsburg, July 9, 1907.)

NITROUS oxid and oxygen as an anesthetic was brought before the profession by Dr. E. Andrews of Chicago in 1868, and it has taken the most of us all the years since to realize the fact that in this combination we have an anesthetic that meets the requirements of the dental surgeon more completely than any other. There can be no question that it is in a class by itself in regard to its safety and its freedom from after-effects.

This is an old subject, though I am sorry to say that both the medical and the dental profession are, in the main, to a large extent ignorant of the possibilities, practicability, limitations, and proper mode of administration of nitrous oxid and oxygen. It is a matter of surprise and chagrin that we find in our leading dental journals such statements as this: "Nitrous oxid, without a doubt, is the safest anesthetic for the dentist to use, but inasmuch as the available narcosis is so short that it restricts materially its general application, therefore it is advantageous for us to use some other agent which, though not so safe, will give us a longer period of available anesthesia." Such statements have no ground, in fact, for we are able with nitrous oxid and oxygen to obtain longer anesthesia without interruption, for work in the mouth and throat, than is possible with other anesthetic agents, except chloroform.

It is astonishing that it takes the profession so long to realize what is being accomplished in its own ranks. While there have been papers read and clinics given for the past four or five years be-

fore our local, state, and national societies demonstrating this anesthetic, still such statements as that just quoted, which occasionally make their appearance in our journals, written, as a rule, by men who have had our confidence, cause us to hesitate in classing their authors among our most enlightened and progressive dentists.

IMPORTANCE OF THE EARNEST STUDY OF ANESTHESIA.

My experience in meeting and talking to medical men as well as to dental has been that the average practitioner knows very little about anesthetics, and less about their proper administration. Sir Frederick Treves stated a truth when he said, "There is a widespread impression that to give chloroform is a minor act—that the power comes with the granting of the diploma, and the significance of the procedure is sometimes emphasized by the remark, 'Well, if a man cannot give chloroform, what can he do?' This is a branch of our profession that is sadly neglected, for from a great many of our schools men are sent out year after year absolutely ignorant of the elementary principles of anesthetic administration. This condition is true not only of schools of our own country but of the schools of Europe as well."

In my mind this subject is of more importance than any other. If the student ever contemplates administering anesthetics at all, owing to the fact that a precious human life is entrusted to his care during every administration, anesthesia should certainly receive far more

attention in the college curriculum than it does now. It is impossible to suppose that all medical and dental men can be educated to that plane of excellence which would make each of them a skilled anesthetist, but all should attain sufficient knowledge to fit them to estimate their own capabilities, and to know when a given case is difficult or dangerous. Above all, they should know the limitations of the agent in hand, and be able to recognize symptoms of danger and know what to do to overcome them.

When we come to the place where we recognize that each patient has his individual peculiarities, susceptibilities, risk, and after-danger, we shall be in position to go on and improve, and to have a proper appreciation of this great subject and thereby become worthy of the confidence placed in us.

It must be remembered that much of the risk involved in administering any of the anesthetics depends greatly upon the skill and experience of the administrator, and by losing sight of this fact a comparatively safe anesthetic may become a dangerous one.

NITROUS OXID AND OXYGEN.

In taking up the physiological action and effect of nitrous oxid and oxygen I wish to state at this time, so that there will be no misunderstanding, that there is no true anesthetic effect derived from the oxygen; oxygen in itself will cause a certain amount of analgesia, but it is not an anesthetic.

Nitrous oxid enters loosely into combination with the hemoglobin in the red corpuscles, partly replacing the oxygen and normal gases of the blood, and is carried throughout the entire system. It is not only an anesthetic but is an asphyxiant as well. If we can remove the latter quality we have an ideal anesthetic agent, as nitrous oxid is practically non-toxic, and there is no other agent known that is capable of producing narcosis with so little constitutional disturbance. The physical properties of nitrous oxid are such that the delicate nerve cells do

not undergo any decomposition, nor do they lose any of their function or integrity after the complete elimination of the agent has taken place. Nitrous oxid has a specific action upon the nerve cells, which temporarily impairs their functional integrity. In order to bring about this condition it is necessary that this agent be administered in an almost pure state, otherwise the amount of free nitrous oxid in combination with the hemoglobin would not be sufficient to produce this effect in its entirety, but the nerve centers would be stimulated, and we would have increased activity throughout the entire system, with more or less muscular movement and mental disturbance.

During the initial stage of its administration nitrous oxid causes the phenomena above described, but as this aroused activity causes an increased depth of respiration, the tidal air in the lungs may be increased to three or three and one-half times the normal amount, thus greatly increasing the diffusion of the agent. This diffusion causes absorption to take place very rapidly, so that we soon have that degree of saturation which is necessary to bring about complete surgical anesthesia. If undiluted gas has been given up to this stage, we will not only have the symptoms of narcosis present but the phenomena of asphyxia will be alarmingly manifested, indicating an extreme condition of anoxemia. This condition of anoxemia is not essential in bringing about anesthesia with nitrous oxid. It is possible in the majority of cases to produce a profound surgical narcosis with complete relaxation of the muscular system without this asphyxial element entering into the procedure at all. By administering pure oxygen continuously with the nitrous oxid we can supply the organism with sufficient oxygen to carry on oxidation so that the vital functions are not impaired, and still have a sufficient saturation of the system with nitrous oxid so that the function of the other nerve centers will be impaired. The percentage of oxygen which will be required in maintaining a proper equilibrium between the intro-

duction and elimination of the nitrous oxid will vary greatly, according to each individual's temperament and peculiarities. But speaking generally, about twelve per cent. of oxygen will be necessary for a continued administration. I have had cases, to which I shall refer in detail farther on, in which I was able to administer as much as twenty-five parts of oxygen with the nitrous oxid, and was able to maintain surgical anesthesia in the truest sense of the word.

NITROUS OXID WITH AND WITHOUT OXYGEN.

It is interesting as well as instructive to observe the effect of nitrous oxid and oxygen upon the brain, and to note the difference when nitrous oxid is administered with and without oxygen. When the nitrous oxid is administered alone we find that as soon as the asphyxial element begins to enter into the procedure, the brain loses its natural pinkish color and turns more or less gradually to a dark purple. If the administration be continued without air or oxygen, it will take on an appearance resembling that of stagnant blood. As this discoloration progresses there is a dilatation of the brain, and the greater the discoloration the greater the dilatation, so that it will protrude through an opening in the skull. One can imagine what this would mean to a patient with a myasthenic heart, or one with apoplectic tendency. This accounts for the headache complained of sometimes after the administration of an anesthetic. The condition of the brain is altogether different when a patient is anesthetized with oxygen in combination with the nitrous oxid. I speak from actual observation, as it has been my good fortune to observe the brain while the patient was under the influence of this mixture. The following will illustrate the point I wish to emphasize:

A CASE IN PRACTICE.

A lad ten years of age was playing on a fence and in some manner fell off, landing on his head. The bruise was

near the junction of the occipital and parietal bones on the left side, causing an epidural hemorrhage. The pupil of the right eye was extensively dilated and the muscles of the same eye were paralyzed from the pressure on these centers within the brain. There was not even a scalp wound from the fall, but he became unconscious almost immediately, and remained in that condition for about twelve hours before an operation was decided upon. His condition was very grave, and little encouragement was given as to his recovery. Nitrous oxid and oxygen was decided upon as the safest anesthetic to give in this case. I started the administration with about eight parts of oxygen with the nitrous oxid, increasing it to twelve parts within the first minute, and was able to obtain complete relaxation in about fifty-five seconds, the pulse, which had been exceedingly rapid and almost imperceptible, becoming full and strong. The face, which was very pale at the commencement of the administration, took on a good color. Respiration became more rhythmical and the patient was actually in better condition than he was before the administration commenced. There was no noticeable dilatation of the left pupil at any time, and the conjunctival and corneal reflexes were soon abolished. The patient passing into a deep and quiet sleep. There was an opening made in the skull, and by delicate manipulation the brain was moved to one side and a large quantity of clotted blood removed.

This operation gave me a long-wished-for opportunity to observe the human brain under anesthesia, and to notice the effects of nitrous oxid and oxygen upon it. I made the following observations:

On increasing the oxygen slightly for about five seconds, I noticed a quick change in color and a perceptible dilatation of the brain. This was not carried very far, owing to the probable injurious effect of such a procedure. On increasing the oxygen to almost one-half of the mixture, it was but a few seconds, not more than nine or ten, until the brain assumed its natural color and returned to its normal position. The

rapidity of the action was a revelation to me, and called forth some expressions of surprise from the attending surgeons.

I can say without reserve that the dilatation and congestion here noticed were not due in the least to the anesthetic action of the nitrous oxid, but the condition was entirely an asphyxial manifestation. Of course the asphyxial factor may be present, no matter what may be the anesthetic agent used, if there be much restriction of or interference with the natural processes of oxidation; therefore the argument for a non-asphyxial method of narcosis.

The recovery of this patient was wonderful. The surgeons did not expect that he would regain consciousness for at least six or seven hours, but to their surprise he became conscious two hours after the operation and made very rapid recovery, regaining all of his faculties and usual vivacity.

SKILL IN ADMINISTRATION.

There are a great many things that can be said in favor of this combination as an anesthetic, and the possibilities are practically unlimited in the hands of one skilled in its administration. Without a doubt it takes more skill to administer this combination properly than it does for some of the other agents that are used for inducing anesthesia; but are we to allow this fact to deter us from using it and employing something we know to be more dangerous? It is essential for every dental operator to possess a certain amount of skill if he wishes to insert a good gold filling, or to construct a nice denture, or to make a serviceable piece of bridge work. But in order to possess this kind of skill it is essential that he should have had the proper instruction in this particular line of work, and to have given it a great deal of study and practical application. We would not ask a blacksmith to fix a watch; nor do we expect a carpenter to be skilled in wiping a lead-pipe joint; but we do expect a plumber to be skilled enough to do the latter. Considering that even these things demand special training, I hope

we will not hear any objection to the use of this anesthetic because it incidentally requires considerable skill in its administration.

When we consider the few fatalities—only about thirty-five—that have occurred under nitrous oxid during the last half-century, and when we take into consideration the fact that a great many of the men who are using it know little or nothing about the administration of anesthetics, or how to prepare the individual for a general anesthetic, it is simply marvelous! Now that we have a practical method for making this agent continuously respirable, the possibilities are great to contemplate!

I wish to express this opinion: No matter what may be the abnormal or pathological conditions present, nitrous oxid and oxygen can be given, if administered by one skilled in its administration, with less risk to life than any other general or local anesthetic now known. I do not mean to say by this that this anesthetic is indicated in all cases, for it may be next to impossible to obtain true surgical anesthesia in some cases where it would be imperative, but leaving the operation and resulting shock out of the question, the above opinion I truly believe to be correct.

CASES ILLUSTRATING DURATION OF ANESTHESIA.

As to the length of time we could safely maintain anesthesia with the combined gases, I would say that this will depend upon the physical condition of the patient to be operated upon and the nature of the operation. But in so far as the nitrous oxid and oxygen is concerned, it is respirable for a greater length of time than any other general anesthetic.

I had a case a few weeks ago which I think will be of interest because it presents the longest time any person has ever been kept in complete narcosis under nitrous oxid and oxygen for a surgical operation. The patient was a lady thirty-three years of age. Nitrous oxid and oxygen was indicated in this case,

owing to some valvular lesion. The patient was large, obese, and of plethoric nature. The operation was the curetting of the uterus, followed by an extensive laparotomy, in which a great many adhesions were encountered, necessitating a tedious dissection. Not being susceptible to the anesthetic, she was a hard subject to anesthetize, as it required about five minutes to obtain surgical anesthesia. Nitrous oxid alone was given for the first few inhalations, and then three per cent. of oxygen was admitted. This amount was gradually increased until eight per cent. was being given. The patient became unconscious in about seventy seconds, but muscular reflexes were quite active for about three minutes. There was some cyanosis present, but I was able to overcome this after the patient had been under the anesthetic about seven minutes, after which perfect anesthesia was maintained to the completion of the operation. This patient was under the influence of nitrous oxid and oxygen, without one breath of air for two hours and forty-eight minutes. Nearly six hundred gallons of nitrous oxid and eighty gallons of oxygen were used. Upon the completion of the operation the anesthetic was withdrawn, and the patient regained all of her mental faculties within one minute. There was very little shock from the procedure. Nausea and other post-anesthetic complications were entirely absent, the patient making a speedy recovery.

The next longest case I had was for an extensive laparotomy. The patient was in such poor physical condition that the surgeons all agreed she would never have lived through the procedure under any other anesthetic. It was necessary in this case to maintain complete surgical anesthesia for two hours and thirty-five minutes. Upon the removal of the anesthetic she regained consciousness in about five minutes. The patient's slowness to revive was due to her extremely low vitality. There was no nausea and she made a slow but uneventful recovery. The small amount of surgical shock in this case can only be

accounted for by the stimulating effect of the oxygen, and also that of the nitrous oxid when the element of asphyxiation is eliminated.

The cases in which we meet our most wonderful successes are those where grave inroads have been made upon the general health from wasting diseases, abnormal growths, degenerate changes, etc. For this class of cases nitrous oxid and oxygen is the anesthetic *par excellence*, and leaves nothing more to be desired.

MORE CASES IN PRACTICE.

Having had nearly six hundred cases in which nitrous oxid and oxygen was used in major operations, I have met quite a few which were very interesting, and also quite a number where the results were marvelous. I will refer to only a few of them here.

(Case 218.) Ruth S., age six years, had been sick with scarlet fever for six weeks and was in a very precarious condition. Systemic abscesses had developed and a mastoid operation was necessary. Owing to her extremely low vitality, the anesthetic was the chief source of worry and apprehension to the physicians. I administered nitrous oxid and oxygen and induced complete surgical anesthesia in three minutes. Respiration was quite rapid and the pulse exceedingly so, being about 160; this was much reduced during the narcosis, and became bounding and of good tension. The operation was completed in about twenty-five minutes, and upon the removal of the inhaler the child regained consciousness in a little less than three minutes. One half-hour after the operation the pulse was again taken, and was found to be in excellent condition.

(Case 212.) Mrs. P., age sixty years, was operated for empyema of the lungs. This patient had been given up as having no chance for recovery. She had been bedridden for about two years, being at this time a mere shadow of her former self, and her vitality very low. Anesthesia was induced in about three or four minutes by using from eight to twelve parts of oxygen from the beginning and increasing this amount greatly, so that I was using about fifteen parts of oxygen when the operation was commenced. I did not produce deep narcosis in this case, as it was not deemed advisable, nor was it necessary. At the completion of the opera-

tion I was administering about twenty parts of oxygen with the nitrous oxid, and still was able not only to keep my patient in the unconscious state, but also free from muscular movement as well. The operation was completed in forty minutes and recovery from the anesthesia took place in about one minute. The patient retched a few times during the first five minutes. After the operation she expressed herself as feeling better than she did before it.

(Case 241.) A baby boy whose birth was induced at the eighth month—being at this time three months old—was operated upon for the purpose of closing a false opening between the urethra and scrotum; circumcision was also performed at the same time. I used no inhaler at all for this case, but instead forced the nitrous oxid and oxygen through the tube, holding it in front of the nose and mouth. Narcosis was soon induced with a mixture of about five parts oxygen from the cylinder and ninety-five parts nitrous oxid. There was a certain amount of adulteration caused by the non-exclusion of the air, but notwithstanding this it was soon necessary to increase the percentage of oxygen in order to prevent cyanosis. Perfect anesthesia was maintained for thirty minutes to the completion of the operation, and upon the withdrawal of this attenuated vapor, recovery took place within thirty seconds. The child seemed as bright as ever, and the sympathetic mother, in her anxiety, put the child to her breast at once and it nursed without any ill effects.

(Case 197.) A little girl, three years of age, was presented for an operation for the removal of pus from the pleural cavity. She was very much emaciated and presented an anemic, cyanotic condition, due to empyema of the lungs—a sequence of pneumonia. There was a continual rattling cough which materially interfered with respiration, and which made this case extremely difficult and hazardous. We found a very weak, rapid-running pulse, almost imperceptible. I consumed about four minutes in producing anesthesia, using a very large per cent. of oxygen. It was possible in this case to maintain tranquil anesthesia with as much as twenty-five parts of oxygen with the nitrous oxid, and the child's condition was actually improved during the anesthesia. The operation was successful and the ultimate recovery of the patient perfect. There was removed from this child's pleural cavity over one gallon of thin greenish-yellow pus. No nausea or sickness from the anesthetic occurred, and very little shock from the operation.

There are a great many cases that I

would like to give in detail, but as the time will not permit, I shall only briefly mention a few more of the most interesting.

I administered nitrous oxid and oxygen to a woman weighing 380 pounds, for an umbilical hernia, the operation requiring one hour and fifty minutes to complete.

In another case, while I had a patient under nitrous oxid and oxygen, two separate operations were going on at the same time; one surgeon removed the entire left breast and the other performed an appendectomy.

SOME GENERAL CONSIDERATIONS.

All of these cases to which I have referred are outside of the field of dentistry, but the point I wish to emphasize is this: If that here employed be the safest and best method to use in these especially dangerous and prolonged cases, it surely is the best and safest anesthetic for the dental surgeon to use in all cases where a general anesthetic may be indicated. It will meet the requirements more fully and will be appreciated by the patients far more than would be the case were any other anesthetic used.

For operations in the mouth or throat, when the patient as a rule breathes through the mouth, this anesthetic can be administered continuously without interfering with the operation, no matter what the duration. I have been called upon to maintain complete anesthesia for operations of this kind lasting as long as one hour and twenty minutes, and it is a very frequent occurrence for me to maintain anesthesia for such work for ten or fifteen minutes, and I want to say that it does not take an expert to do so, either.

Men who have knowledge of general anesthetics say that nitrous oxid and oxygen is the safest. Yet most of them erroneously lay stress upon the shortness of the anesthesia obtained. I wish that I could for all time disabuse their minds—and yours as well—of this fallacy. The length of narcosis is at your command. One can keep his patient anes-

thetized to the completion of any oral operation.

I wish to impress upon you this fact, viz, that if one wants to maintain prolonged anesthesia with any anesthetic, strict attention must be paid to the diet of the patients, also see to it that they are loosely attired, or else they will experience trouble and after-sickness. All patients expecting to take a general anesthetic for any length of time should, by all means, be in a proper condition as far as the diet and bowels are concerned. For short administrations this is not so essential; but no anesthetic should ever be administered on a full stomach, owing to the danger involved from such a procedure. When the patient has had the usual preparation for a surgical operation I have met with very little nausea and vomiting, and have never had a case that gave me any trouble in overcoming.

The day is approaching when it will be absolutely necessary for us to do painless dentistry, and this leads me to say that there is another phase of this anesthetic—the analgesic stage. The employment of nitrous oxid and oxygen in the practice of humanitarian dentistry has a field far beyond the perception of the great majority of the dental profession who have not employed it in their work. Some six years ago I employed this method—the analgesic stage of nitrous oxid and oxygen—for the first time for painless preparation of cavities and the removal of pulps.

It is a mystery to me why more of the profession do not take up this line of work. The use of this agent will prove a joy to the one who uses it as well as to those operated upon.

We cannot consider this as an agent that merely obtunds sensitive dentin, for it produces a general condition. This may be due to the direct influence of the agent upon the nerve centers, or upon their peripheral endings, or both. Nevertheless, we do know that sensitive dentin can be worked upon without great pain, while the gum and other tissue may still be sensitive. This may be accounted for from the fact of the minute

peripheral nerves existing in the dental tubuli.

The question of safety may arise in your minds; as to that I will say that so long as the state of analgesia is maintained and the element of asphyxia is entirely removed, the life of the patient is in no danger.

COMPARISON WITH OTHER GENERAL ANESTHETICS AS TO SAFETY.

I should like to devote some time to comparing other general anesthetics with nitrous oxid and oxygen, but knowing that I cannot dwell long on any one point of so broad a subject, I will content myself by giving you the opinion of a few experts.

Dr. W. J. McCardie says: "Regarding somnoform, it is stated that it does not offer any advantage, but that it is less safe than any ethyl chlorid, for the reason that one of its components is ethyl bromid, and secondly, because the last few doses are liable to decompose and produce serious effects during or after the inhalation." And further: "Discussing the applicability of ethyl chlorid to dental practice the author emphasizes what he has stated in previous communications, namely, that this anesthetic should not be used in dental practice if suitable anesthesia can be obtained under nitrous oxid, for the reason that it is less safe, and secondly, because of the severity and frequency of such dangerous and annoying after-effects as collapse and vomiting."

Dr. J. T. Gwathmey of New York city, when closing the discussion of his paper, "A Plea for the Scientific Administration of Anesthetics," which was read in the section on Laryngology and Otology of the American Medical Association in June says that "Nitrous oxid and oxygen gas is unquestionably the safest anesthetic in the world; anybody studying the subject clinically and theoretically knows that."

In Dr. Bellamy Gardner's paper, which he read before the Odontological Society of Great Britain, February 1906, we find the following opinion. He (Dr.

Gardner) confirms "the prevalent expert opinion that ethyl chlorid is only second to chloroform in danger, and while its use is very attractive, the overwhelming evidence as to the practical safety of nitrous oxid and its mixture with oxygen renders experimental or routine use of anything else less reliable, excepting with the most elaborate precautions, almost criminal."

In Dr. Harper's paper, "Some Notes on Anesthetics," which appeared in the May number of the *British Dental Journal*, we quote the following: "In nitrous oxid we have an old and tried anesthetic for dental purpose. Its administration is well understood; the various stages of narcotization are easy to follow in their well-ordered sequence, and no difficulty is experienced in reading the well-marked signs of complete anesthesia." Again, "For a successful administration of a drug like ethyl chlorid a skilled administrator is necessary, a suitable patient properly prepared, and sufficient time at disposal to admit of a possibly prolonged period of rest and quiet after the administration—a combination of factors seldom present in everyday dental practice. It is in this class of practice that the least dangerous anesthetic is the one which should commend itself most, and while nitrous oxid and oxygen are available, necessity can but seldom arise for the exhibition of a drug having the lethal possibilities which ethyl chlorid undoubtedly possesses."

Dr. F. C. Eve of England has this to say of somnoform: "Somnoform, which is a mixture of ethyl chlorid, methyl

chlorid, and ethyl bromid, is agreed on all hands now to have no advantage over the pure ethyl chlorid. It is more expensive and more dangerous."

After a careful study of the subject I must say that I cannot see any material advantage over pure ethyl chlorid, and as the compound is much less stable and more expensive I should prefer the former, though I have never yet seen the need of either. I have seen some alarming results from the use of somnoform, and was not surprised when I heard of the death of Mrs. William Herbig of Illinois and Mrs. Devendorf of Grand Rapids, Michigan. I will not go into detail on the composition and action of this drug, somnoform, but hope it will be brought out more fully in the discussion which is to follow. My principal objection to somnoform lies in the fact of its exceedingly rapid action without any definite symptoms to indicate the different stages of induction. The physiological effect of an anesthetic must not be so rapidly acquired or so intense as to interfere with the control of its effects by the administrator. The nerve centers pass so rapidly under the influence of somnoform that it is a grave problem indeed to control its effect. On this account it is almost an impossibility to continue surgical anesthesia with this method.

Therefore, in consideration of all these facts from various reliable sources and from my own experience, I am convinced that nitrous oxid and oxygen is the most practical and the safest anesthetic for the dental surgeon to use.

ON PREPARING DENTAL PAPERS.

By L. C. F. HUGO, D.D.S., Washington, D. C.

(Read before the Dental Society of the State of New York, at its annual meeting at Albany, May 10, 1907.)

THE writer, lest he be misjudged in his position with regard to what is here presented, disclaims at the outset all intention of assuming the master or teacher. From such presumption his consciousness of shortcomings, alone, would preserve him. He has written from the standpoint of merely an observer and a learner, who, however clumsily he may do it, wishes to direct passing attention to an important subject. He realizes fully that the preparing of papers is a question not so much of didactic advice, as of aptitude, temperament, occasion, experience, and education. Yet it cannot but be interesting, and possibly useful, to inquire what are desirable or undesirable features in dental essay writing.

SUBJECT.

The dentist whose ideas flow easily from his pen—and that they can do when he is an inventor, discoverer, or investigator—is quite willing to write and be heard. To him the preparing of a paper is an opportunity and a pleasure. He needs no suggestions as to subject. To the dentist, however, who is not so ready, and who has no pet theme, “preparing something for the next meeting” is usually a *task*. He may find the selection of a subject a troublesome question. He feels that as he is to address his peers, clear-headed, practical, critical men, he must offer something that will hold their attention. He knows that they have an unappeasable desire for the new. He is aware that though some subjects have almost been written out, there are many upon which the final

authoritative word has not been spoken, and still others that are hardly beyond the stage of speculation. There pass in review before his mind the larger questions of policy, education, science, ethics, etc., in none of which he may have anything broadly new; and, in the more directly practical aspects of his work, he seemingly fares no better. Finding that he has nothing of his own of sufficient importance to occupy the usual length of a paper, he still can, in a way, meet the demand mentioned by discussing one of the reigning novelties that may be before the profession. But here, however, in the case of unfamiliar subjects, he feels that he would be treading upon dangerous ground. Here, in the absence of special or technical knowledge, of original experiment corroborative or disproving, he might, if he be not a skilful commentator, make a dreary mess of it. He may have heard papers composed mainly of long quotations, and a rambling commentary on the unchallenged or unproved opinions of other writers: his good sense will not let him engage in such a performance. Nothing eligible, then, among things new, there is left him apparently but one resource—going to the “boneyard.” If pressed to this extremity, he reluctantly drags forth an old bone upon which a hundred men have left their gnaw-marks, and listlessly worries off a few juiceless chips.

But what is the poor fellow to do? Let him consider again. If he cannot assume the swinging stride of the giants of the profession, let him take safe, short steps. In other words, if he cannot write an epoch-making paper, let him do well a humbler thing. If he has

nothing new in a large way, and is not fitted by training to discuss edifyingly the new of others, and does not wish to prose in the outworn, he had better again look over the field of his thought, experiment, and practice, and from that—no doubt he can find it—select something that may have an element of at least living interest. Let him take a simple idea embodying a pain-saving, a labor-saving, a time-saving method or device that he may have originated or developed, or that may not be generally appreciated, and upon that write a paper, regardless of how few pages it may cover. Better only ten minutes of the society's time occupied with a minor matter of this kind, driven home, than an hour consumed with wordy rehashings or with a ponderous deliverance on a subject ambitiously but imprudently chosen.

OUTLINE PLAN.

We shall now assume that the essayist has selected his subject wisely. If he is not an experienced writer he will find it well worth while, for the first step, to make an outline plan of his theme, so that he may arrange in logical sequence the heads for the proper placing of the arguments, illustrations, descriptive cases, etc. The value of such a scheme cannot be over-emphasized. It is like a trellis upon which the vines and fruit may develop in order, in light and in health.

MATERIAL.

The material for his paper the essayist gets from two sources—from personal experience and knowledge, and from reference to the work and writings of others. As to the first of these sources, he should aim to give his ideas freed as much as possible from prepossession. He should argue and demonstrate rather than advocate. It is always better to understate slightly than to overstate. What is thus maintained will both carry farther and give less trouble to prove. As to bibliography, it will be enough to con-

sult pertinent standard works, and the last decade or so of our leading dental periodicals. The essayist may find here facts and opinions, for and against, by some of the best and most experienced practitioners and investigators. He may get not only data but also suggestive matter. Of course he must be on his guard against a too free use of historical and elementary detail.

Having digested the material—that is, having well pondered the thoughts and carefully weighed the words—he is ready to arrange it in accordance with his outline plan, to amplify it, and to weld its parts into an harmonious whole.

Now, with a comprehensive view of his subject as it stands before the profession, together with his own opinions, suggestions, or descriptions of improvements, expressed in simple language, the essayist should be in a position to present an acceptable and possibly stimulative paper.

TREATMENT.

Though the *matter* of a paper is of the first consideration, *manner* has more or less to do with making the matter effective. A weighty thought may fail of its due force by reason of crude, inadequate presentment; while, on the other hand, unfortunately a less weighty thought may be given factitious importance by skilful, attractive presentment—showing that there is something in the way a thing is done.

The limit and purpose of this paper will permit but a brief consideration of only a few of the more substantial and more important qualities of good composition. Among these may be noted, as to *words*, accuracy, appropriateness, and copiousness; as to *construction*, clearness and conciseness.

(a) AS TO WORDS.

Accuracy. In what we desire to communicate very much depends upon the employment of the right word—the

word, in fact, that will express definitely the thought we wish to convey. In general, much wrangling would be avoided and valuable time saved if greater discrimination were practiced in the use of our intellectual medium of exchange. Though in our discussions no serious harm will result if, for example, the term "nerve" be used for pulp, "crown" cavity for morsal cavity, "lime" salts for calcium salts, "arsenious" acid for arsenic trioxid, or if pyorrhea alveolaris is applied to a number of diseases which the term does not fit, yet, if our writings are to be embodied in dental literature, it is desirable that particularly the words of technical signification should be accurately representative of the thought in the author's mind. This is necessary for reliable reference. It adds to the scientific quality, to the practical value of our literature, to have an exact and uniform terminology.

Appropriateness. Objection to the fondness in some essayists for "big" words is occasionally made, and within limitations is justified. We should, however, in making such complaint discriminate between the so-called big words necessary to the consideration of technical matter, and the polysyllabics, notably of classic derivation, used in the discussion of matter of a non-technical character. Scientific or abstract ideas, in order to be made clear and precise, may require words and phrases derived from the languages of peoples that first named the verbal tools of science and philosophy. True, Saxon words may acquire specific technical meaning; but, as they commonly have many and widely differing significations, they are not always so safe as the more restricted classic words.

We sometimes go to extremes in employing unusual technical terms. If, for example, we wish to speak of tooth-decay, we do not aid the expression of the thought with the "ink-horn" monster *odontatroph*. So with *odontosteresis* for the loss, *odontoloxia* for the irregularity, and *odontoplerosis* for the filling of teeth.

Some terms, though of "learned length

and thundering sound," are not objectionable when they take the place of clumsy, vague, or roundabout expressions. In this connection the writer recalls the fact that his first discussion of a dental subject to reach print was the defense of the term "prosthetic" as preferable to the prevailing "artificial" and "mechanical." The better word, though treated with scorn and contempt, has gradually found general acceptance.

In the not strictly technical parts of a dental essay big—or what is ordinarily meant thereby, classically derived—words must be used with good judgment. Beyond question, in their place we may employ them to advantage; but we should not go out of our way to clump around on Greek and Latin stilts when we can walk straight to the mark in the plain shoes of everyday speech. High-sounding or foreign terms, as such, add nothing to the thought. Indeed, they often interfere by withdrawing attention from the end to the means. We may apply here an observation of Spencer's: "Whatever force is absorbed in the machine is deducted from the result." The use of classically derived words is proper enough when the more familiar Saxon vocables are inadequate, or involve awkward periphrasis. It is their abuse, in the hands of the indiscriminating or of the pretentious, that makes "dictionary words" an offense and that loads them with ridicule.

A judicious choice from the two great sources of English yields the most acceptable and effective diction. We should therefore not hesitate about using words, whether they are of simple Saxon or of sonorously classic origin—so long as they are consistent with the subject, enjoy authoritative sanction, and express fully and intelligibly our meaning.

Copiousness. The vocabulary of a well-educated man may number as high as thirty-five thousand words; though from five to ten thousand may be sufficient for all his purposes. About fifteen hundred are sufficient to meet the demands of ordinary social intercourse: and Italian opera, so we are told, can get along with only eight hundred words.

Obviously, discussion of technical, scientific subjects requires an extended verbal range, which in written discourse may be further enlarged by variant locutions to avoid wooden repetition.

"There is such a thing as poverty of words as well as poverty of thoughts." We may cut out a cavity and fill it, all with one and the same point—a manipulative "stunt" sometimes performed at clinics. Though this may be done in a very limited number of cases, there are many cavities that cannot even be prepared in such a manner—to say nothing of the filling. While, on the other hand, in the uncomplicated operations we do not need a multiplicity of instruments—they may, in fact, get in our way—still, to meet all cases, we should have a cabinet supplied with a wide range of specially adapted means. So it is with the expression of thoughts; they sometimes require words and phrases beyond such as are adequate for the simple processes of the mind. Hence the necessity for a sufficiently varied range of vocabulary. Discriminating judgment must rule here, as well as in the choice of instruments. Words are only tools, and must not get in our way.

(b) AS TO CONSTRUCTION.

Clearness—that is to say, precision of thought, exactness of statement, and effective arrangement of words—has ever, from Aristotle down to Saintsbury, been regarded as the arch-requisite of good writing.

"First think, then write," we are advised. If the thought be not clear in the mind it will be obscure on paper. Even there, though quite clear to the author, yet because of too broad or too narrow a meaning of some word or phrase, the thought may present itself in such a form to the hearer or reader as wholly to mislead him. Therefore, what is written should be rigorously inspected as to the reasoning and as to its expression; that is, it should be examined—if the homely comparison be permissible—for soft spots, as old-time soft-gold workers test the solidity of their fillings.

Want of clearness, and of force, may result from the unskilful or slipshod disposition of the parts of a sentence. The words and phrases of relation must be properly placed—that is, near the elements upon which they bear; and the important words and phrases should be put where they will receive emphasis.

In the building of sentences there is great art. The longer and more involved they are, the greater the need for exercise of the art. As the craftsmanship of a De Quincey is quite rare, it behooves us to be on our guard when we attempt "labyrinthine" construction. Indeed, avoidance of it as far as practicable would, on the score of clearness, be discretion. But whether our sentences are long or short, we must let the central thought stand out plainly; that is, we should not encumber it with too many qualifiers. Only necessity, or a gala occasion, will warrant driving Choate's "substantive and six."

Conciseness is an important factor in achieving one of Spencer's desiderata of writing, viz, economy of the hearers' or readers' attention. The dental essay is almost always descriptive, sometimes expository. Yet compression—even if it does not reach the "closely packed style that says twenty things in ten words"—when consistent with clearness and ease, is ever to be commended.

No hearer or reader cares to look for a needle of thought in a haystack of verbiage. "It is with words as with sunbeams, the more they are condensed the deeper they burn." The Spartans cultivated verbal economy to such an extent, that they would fine a man if he used three words where two would serve. What we write should be subjected to repeated and unindulgent revision. Almost invariably the result is the closer packing of thought and the cutting out of here a word, there a phrase, a sentence, or even a paragraph. But we must not strip the expression of thought down to the bones. Compression carried too far may lead to dry bareness and obscurity.

In our desire to make sure of being understood we sometimes offend against

conciseness. Though the first requisite of thought-communication is clearness, we should not seek to attain this quality by over-minuteness of detail. We should credit our dullest hearer or reader with intelligence enough to make long-drawn-out exposition unnecessary. Such kindergarten methods are wearying, and may degenerate into padding. It may be said here that a little more care given to securing conciseness, and clear, effective arrangement would be most heartily appreciated by our revising editors.

This ends the consideration of the literary essentials of the dental essay. As intimated before, this paper cannot concern itself with the subtler features of composition, or with what is purely individual to essayists as writers. A few general remarks, however, on writing may not be out of place.

The character of the subjects for dental papers is generally such as to save us from the most glaring vices of style. We have but little opportunity to offend in the way of what rhetoricians call "fine writing." An inexperienced essayist, particularly if young, may on occasion be betrayed into exuberant rhetorical flourishes, or possibly into grandiloquence—into pounding the big drum and clashing the cymbals—with results as empty as the one and as jarring as the other.

Offenders of the kind just spoken of may profitably take to heart the warning given by Falstaff to Pistol: "If thou hast any tidings whatever to deliver, prithee deliver them like a man of this world." Some subjects, but only in the hands of masters, admit of the lofty, the ornate, the "full-resounding line." When, however, such treatment is essayed by ambition misapplied, the product is highfalutin. As the thought in our papers is usually plain, straightforward, it will look best in plain garb. Homely, terse language is safer and more telling than the merely highflown and gorgeous. Beecher says: "Don't whip with a switch that has the leaves on if you want to tingle."

While the essayist of good taste will avoid strutting in the imperial purple

of the grandiose, he will be equally careful to avoid the too colloquial or the slipshod in style. It is expressing but a truism to say that in our papers, as in our professional work, we may exercise an influence for evil as well as for good. Someone has truly observed that "No man is so insignificant as to be sure his example can do no hurt." Care should therefore be had to employ only that which is appropriate and dignified. When the subject allows the choice we should prefer simplicity of expression, but cross-roads newspaperese must not be mistaken for simplicity.

It is a maxim that "composition that costs little is worth little." Truly, to produce good writing it must be done "in the sweat of thy face." It is not expected that we as essayists shall spend much time on verbal niceties, euphonic sequence, rhythmical adjustment, and other graces. Our thoughts may

—shine

Through the harsh cadence of a rugged line.

Dental papers are not prepared for their literary value. We need not be so fastidious as was De Quincey, who wrote and re-wrote parts of his "Confessions" not less than sixty times. We are not called upon to write an *Æneid* requiring eleven years, with three more for revision; or a Gray's "Elegy" taking seven years; or a Pascal "Letter" demanding twenty days. Such agonizing literary travail would be for us "wasteful and ridiculous excess."

But, is it not true that though the papers read before our larger organizations are as a rule of a high order of merit, some of those before our home societies are not given the care, in respect to essential qualities of good composition, that they might receive if intended for, say, the National Association? Surely we all wish that the body of our literature from whatever source may measure up, in both matter and manner, to that of our related professions. The increased appreciation exhibited by our hearers when we offer something that shows research and also care in presentment makes plain the value of effort, and should serve as a

powerful incentive to make us reach a high standard.

RÉSUMÉ.

In preparing papers, if we have invented, observed closely, or investigated or thought deeply, we are not at a loss for a subject. If we are not delvers, choosing a subject may be comparatively difficult; yet, if we go about it earnestly, we can, with a due sense of our limitations, find something in our experience at the chair, or in the laboratory, or in our observation of matters connected with the abstract relations of dentistry, that, although not of striking importance, may still be interesting and profiting to some if not to all of our hearers and readers. We should consider that even small increments have their place in the progressive building of our art and science. The material, composed of original observations and of jottings while reading up, should be fitted to place in a synoptic scheme based on logical sequence of thought. In the treatment of the subject, so far as words are

concerned there should be: Accuracy—that is, they should leave no doubt as to the author's meaning, and should conform as nearly as may be to accepted terminology; Appropriateness—that is, they should be consistent with the thought and subject, preference being given to the familiar and simple, though, if these are not adequate, classically derived forms should unhesitatingly be used; and Copiousness—that is, not wordiness, but resourceful variety. As to construction there should be: Clearness—that is, precise, forcible presentment, with one prominent thought to a sentence and not too elaborate a predicate; and Conciseness—that is, direct statement, avoiding "tedious dilution of thought" and tiring minuteness of detail.

Finally, it may be said that as the purpose of writing is to communicate thought, this should be accomplished in the most effective manner. Our style should neither be stiff to starchiness, nor be limp to slouchiness; it should combine simple dignity with clearness, force, and ease.

THE LOSS OF TEETH IN CHILDHOOD, AND ITS EFFECT ON OCCLUSION AND THE FACE.

By D. W. FLINT, D.D.S., Pittsburg, Pa.

(Read at the thirty-ninth annual meeting of the Pennsylvania State Dental Society, Pittsburg, July 9, 1907.)

SINCE taking up the work of orthodontia it has been my privilege to observe more carefully the existing diversity of opinion among practitioners concerning the care to be bestowed on the deciduous dentition, and its importance in its bearing on facial and dental development. That it is an important subject all admit, but that they do not sufficiently impress it upon the parents, pointing out the degree of hygienic care that should be given, is, I believe, likewise the case.

It is my purpose to show you to what extent the premature loss of even a single deciduous tooth will affect the permanent dentition, and how caries by destroying the approximal contact of the teeth may cause a shortening of the jaw on that side, especially in the case of lower teeth, throwing the whole mandible into malocclusion and marring an otherwise good face.

I take it that everyone here understands the importance of the normal relationship of the jaws, teeth, and con-

tiguous parts, and it is only to those who realize this that I address my remarks. The man who is practicing dentistry for selfish reasons cares nothing for this law of occlusion; but to the ethical practitioner it is of vital importance that in not a single restorative operation should he lose sight of the natural harmonious arrangement of the teeth, viz, normal occlusion. This is the platform on which not only orthodontia but the whole of dentistry must stand.

The study of malocclusion in childhood involves a consideration of the following important causative factors:

(1) Premature loss of the deciduous teeth.

(2) Prolonged retention of deciduous teeth or roots.

(3) Loss of the permanent teeth, including the first molars, by extraction.

(4) Tardy eruption of permanent teeth.

(5) Non-eruption of permanent teeth.

Before taking up these five causes seriatim it may be well to make the axiomatic statement that a face is only as nature intended it to be when all the teeth are present and all in proper alignment.

The function of the deciduous teeth is twofold—namely, they are the organs of mastication until their physiological loss; and again, they assist in a mechanical way in developing the alveolar process and the jaws proper. Close to the time of eruption of the permanent teeth there occurs a gradual lengthening of both lateral halves, and if there be no caries on the approximal surfaces, and all the deciduous teeth be present and in correct alignment, the first molars will erupt between the maxillary tuberosity in the upper jaw, and the ascending ramus in the mandible. Coincident with the development of the jaws the deciduous teeth are carried forward, and the normal mesio-distal lengthening takes place. The anterior region develops laterally. We should be able to observe the presence of these developmental spaces, and if we do not, some means should be resorted to whereby this normal widening may be induced, for other-

wise a crowded condition of the permanent teeth will be the result. If for some unaccountable reason the development above referred to does not take place, the expansion of the arches can easily be brought about in order to assist nature in what, left alone, she failed to accomplish; for to those who have read Dr. Bogue's recent paper "Theories Made Facts," it is quite clear that the condition will not improve of itself.

PREMATURE LOSS OF DECIDUOUS TEETH.

If the first deciduous molar should be lost, what will be the consequences? The first molar will exert its wedging influence upon the second deciduous molar, pushing it forward—the natural tendency of tooth-movement—but as lip pressure will force the anterior teeth backward, the space previously occupied by the first molar will be obliterated. If this tooth be lost on one side only, there will be an inequality in the length of the sides of the jaw, with all the attending malocclusion, especially if this molar be a lower one.

Perhaps the deciduous canine is sacrificed more often than any other tooth, in order that the permanent lateral incisors may occupy their normal position, but what of the oncoming permanent canine? Lip pressure pushes the anterior teeth backward in normal breathers, while the first molar is doing its work of pushing forward, and soon we find that the first bicuspid is in contact with the lateral incisors—a condition resulting in supra- and labial occlusion of the canines, one of the most disfiguring of dental irregularities. In such cases, do not extract the first bicuspid, expecting nature to push that canine down, but give the child the face he or she would have had; expand the arch, thus bringing the incisors forward and providing space for the canines to assume their normal position.

Right here some morals might be pointed—as: Do not extract the deciduous teeth. If carious, fill them, especially if on the approximal surfaces, thus restoring normal contour; if absent,

maintain the spaces by "G" wire attached to bands and adapted to the teeth anterior and posterior to the space, thus placing the arches in a condition which will lead to normal development.

Again, in the presence of short-bite teeth when the deciduous laterals are lost prematurely, often the permanent centrals will drop into occlusion just distal to the lowers.

PROLONGED RETENTION OF DECIDUOUS TEETH OR ROOTS.

In some cases nature, for some unaccountable reason, fails to absorb the deciduous roots, which of necessity will deflect buccally or lingually, mesially or distally, an erupting tooth, if the retained roots are not extracted.

If we should be in doubt as to the condition of the roots of deciduous teeth, there is but one way of deciding upon the procedure, and that is by means of the X ray. I have in mind now a patient of a family who from hereditary conditions have all—grandmother, mother, and daughter—failed to erupt the two permanent laterals above and below. By the use of the X ray we can determine how best to give the young patient as good a mouth as possible under the circumstances, awaiting the time when the lost organs can be replaced by bridge work.

I will show you slides of another case—that of a girl of twelve, who at that age retained her deciduous upper right central, while all the other permanent teeth had erupted. The attending dentist removed the tooth, but the permanent central still failing to erupt, a radiograph was taken which showed quite distinctly the permanent tooth, and yet the dentist who extracted the deciduous tooth was blamed and harshly dealt with for doing that of which any of us might be guilty.

The X ray is our best help in the diagnosis of cases of this second division.

LOSS OF PERMANENT TEETH.

When permanent teeth are lost the shortening of the arches is involved in just the same manner as in the loss of

the deciduous teeth. It would seem superfluous to allude to the evil effects resulting from the extraction of the first molar, but as this question is an integral part of the subject under discussion, some reference to it appears to be indicated. I agree with Dr. Bogue in naming this tooth the principal molar, for it cannot be lost without serious evil resulting. That some practitioners are compelled to commit this professional crime I will admit, but surely no one in this age—with all the modern methods of treatment and other conditions for restoration, and with our mechanical devices—would be guilty of ruthlessly removing a good molar, or even a very bad one until after all endeavors had failed to restore such a tooth to a healthy condition.

There appeared some years ago an article by Dr. Mitchell of London, which is of interest as it shows the stuff that is being printed, from which we dentists are supposed to get a good intellectual meal. He said, "The points I wish to bring out are when and why the sixth-year molar should be extracted. I purpose by my deductions, based upon experience, to convince those who have heretofore been opposed to the extraction of these teeth that we have a practical and legitimate means of preventing to a great extent the ravages of dental caries, especially that produced by lateral pressure, and the securing of a more serviceable dental armament, by the more perfect safeguarding of the interproximal space than is possible by flat and imperfectly contoured fillings; and later, by affording patients a more perfect masticating surface; and last, but not least, the satisfaction of securing to the patients in the most practical way probable immunity from constant and prolonged dental operations the greater part of their lives." Such teaching as this is just what some men are looking for, because it is an easy way out of work, good and hard at times, and if one could only hush conscience and hide behind such teachings for a justification of this perhaps greatest crime, how happy they would be!—for "If the other fellow does it,

I guess I will." When shall we extract this most important tooth in the whole arch? Never, if there is any possible way of saving it. The writer would leave you to believe that the part was greater than the whole; that the Creator made a mistake when He put the gum tissue around the teeth just so. There is no better condition possible than normal interproximal contact for guarding against the pushing of foods into those spaces. Another question: If it be necessary to extract one molar, why do certain practitioners insist on taking out all four? I may be able to answer it by throwing a few slides on the screen, showing to what a serious extent the development of the face is interfered with.

I want to tabulate some reasons why this principal molar is so important and should be retained at all costs:

(1) Its loss interferes with the active force concerned in the development of the jaws mesio-distally.

(2) It is necessary for mastication at a time when the deciduous teeth are loosening up and are being lost, and it is from a physical standpoint the largest and most powerful of our grinders.

(3) Its loss shortens the jaw on whichever side it is lost, and produces a marred facial expression, oftentimes amounting to a real deformity.

(4) Its loss affects speech. I will show you one slide where, owing to the boy losing the upper first molars previous to the lower, the upper anterior teeth dropped into lingual occlusion, and the spaces between the upper and lower bicusps caused a constant hissing sound when articulating. "Why, I can talk plainly," were his first words after the regulating appliances were removed.

(5) The first molar determines largely the relative overbite, and if it be lost prematurely, the size of the entire oral cavity is materially lessened, and at times the tongue is cramped for want of space.

(6) When this keystone is lost we never know in what direction the shifting of the teeth is going to take place. At times the second bicuspid will drift back toward the second molar. The latter almost invariably rotates, thus de-

stroying the relationship of the cusps for even a fair mastication, and then we find the interproximal spaces open for the accumulation of food particles, which in turn cause pain, inflammation, and alveolitis.

(7) When the first molar is lost the second tips forward, pushing the upper jaw forward and the lower one backward. It changes the relationship of the lateral halves.

(8) The cusps on the remaining teeth are worn unduly and abnormally, owing to the loss of support and extra stress on their inclined planes.

(9) It is the best tooth for the anchoring of either fixed or removable appliances in the treatment of irregularities.

(10) It is also a good tooth for diagnostic and retentive purposes.

(11) Its loss interferes with the development of the maxilla, which in turn affects the allied structures in the nasal cavity, and it does not require a very great stretch of the imagination to picture a patient with a short upper lip and end-to-end occlusion—such a patient losing, say, a lower molar would have to put forth an effort to close the lips at all times, and in a short time would be compelled to keep the mouth open, and acquiring the mouth-breathing habit would be subject to any and all the ills which may be indirectly caused by the absence of nasal breathing.

TARDY ERUPTION OF PERMANENT TEETH.

When a tooth fails to erupt, the space normally held tends to close up by muscular lip pressure pushing backward and the developmental forces pushing forward. The X ray is used to determine the location of such conditions.

NON-ERUPTION OF PERMANENT TEETH.

In congenital non-eruption of any of the permanent teeth, there is always a shifting in the occlusion the same as in the previous division. In such cases the lateral incisors are the teeth most frequently missing.

CORRESPONDENCE.

GOLD, OR GOLD AND PLATINUM, CEMENTED LININGS FOR
AMALGAM AND GOLD FILLINGS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have read with great interest the report in the *Cosmos* for June 1907 of the paper read by Dr. I. N. Broomell before the New York Odontological Society on "Does the Cemented Filling Preserve Tooth-Structure Better than the Filling Inserted Without Cement?" and the discussion thereon.

For more than twenty years I have almost invariably used cement under amalgam fillings, and it has, I believe, been ten years or more since Messrs. Ash & Sons began making for me a special cement for linings, which was introduced under the name of the *Dirigo* cement. Soon after inlay work was introduced it occurred to me one day, while preparing a gold matrix, that perhaps the best possible way for filling cavities might be a combination of the methods of inlay work with the ordinary gold filling and the cement-lined amalgam filling. After a few months' experimenting I settled on the method which I will now describe, and which I have followed for more than seven years with a satisfaction I could not have thought possible in filling operations of any kind. I may say that I have never demonstrated the method in public, although I have several times done so privately. My son, Dr. Percy Norman Williams, now practicing in Ithaca, N. Y., saw the method when with me in London, and Mr. Evan Jones, my assistant in prosthetic work for several years, knew of it, and I believe called attention to the method when he was demonstrator at the University of Pennsylvania. I have also called the attention of several American dentists to the

method, but up to the present time the only mention I have seen of it is in *Elliot's Quarterly*, published at Edinburgh, in which an article appears copied from the *Cosmos*, by W. Thompson Madin, L.D.S., of Birmingham, England.

From Mr. Madin's paper it would appear that he had independently discovered the method which I had been using daily for at least five years before the date of his paper. As I supposed that attention had repeatedly been called to this method in America, and as Mr. Madin's paper was published in 1905, I was not a little surprised to find no mention of the operation in the discussion before the New York Odontological Society, especially as a considerable number of the most eminent members of our profession took part in this discussion.

Gold, or gold and platinum, cemented linings for amalgam and gold fillings. For cemented linings for amalgam fillings I have experimented with a gold and platinum combination made for me by the Consolidated Mfg. Co. of New York, the idea being that the introduction of a very thin sheet of platinum would tend to prevent the mercury in the amalgam from destroying the matrix, and so avoid the staining of tooth-substance; while the larger part of the thickness of the matrix which comes next to the cavity walls, being of gold, permits more perfect adaptation and burnishing to cavity margins. I have also used this combination for porcelain inlays.

The matrix for both amalgam and gold fillings is prepared precisely as for porcelain inlays. For amalgam fillings,

the matrix being fitted, I proceed as follows: Several balls of absorbent cotton are prepared, the cement mixed, and the cavity smeared with it, and then the matrix is introduced and forced thoroughly into place by packing the balls of cotton solidly into the matrix. The margins of the matrix are now carefully burnished to place, and this I regard as the most important part of the operation so far as amalgam work is concerned. It should be done quickly but thoroughly in order to insure the most perfect joint. After this burnishing another ball of cotton is placed over the whole, and a strip of thick rubber dam carefully drawn over all and pulled steadily, without any lateral motion, for about two minutes if a quick-setting cement is used. The cotton may now be removed. If the matrix should be punctured, the fibers of the cotton in the bottom of the matrix will of course stick and give a little trouble in removal. Some may prefer to introduce the amalgam directly into the matrix, but I prefer the method described. The amalgam is now introduced and the filling completed, but I rarely attempt to finish the margins if a second appointment can be made. The operation may, however, be completed at one sitting if a quick-setting amalgam be used.

Dr. Broomell and Dr. Head and all others who say that the failures of fillings are due to minute spaces, particularly about the margins, are perfectly right.

In one of my papers which was read before the Odontological Society of New York several years ago, I called attention to the fact that failures in fillings were chiefly due to imperfections that are microscopic and therefore impossible to detect at the time of the operation. But the method above described gives a filling that is free from even microscopic defects, if carried out with reasonable care. I believe that those who are accustomed to the use of amalgam in the ordinary way, even when they have used cement as a lining, will be greatly astonished at the results which the above-described method will give. For the

matrix I never use anything thinner than No. 60 for either amalgam or gold. This gives sufficient substance to burnish and finish to a perfect margin, and nothing approaching the perfection of this margin can be obtained in any other way.

In gold work I use the No. 60 gold matrix both with cement and without, but I am inclined to think with Dr. Head that the careful operator will reach the highest degree of perfection if the enamel margins are entirely free from cement. With a No. 60 gold matrix in position at the start, the packing instrument never by any chance comes in contact with the enamel margins. If these margins have been carefully prepared they remain in a perfect condition. In all approximal cavities I use some form of the ordinary steel matrix, generally the Crenshaw. The No. 60 gold folded over the margins of the cavity prevents the steel matrix from coming in contact with the tooth, and gives just sufficient extra thickness of gold for the finishing of a perfect margin. As I have said, I think the expert operator will do best, where he has strong cavity walls, to have bare enamel margins, but with weak walls and for the operator of average ability, I believe the cemented matrix is preferable, but great care should always be taken to force and burnish the margin of the matrix quickly after cementing, and then wait until the cement is hard before proceeding with the introduction of the filling. The line of cement with these fillings is far finer than it is possible to get with any form of baked or cast inlay. For completing the gold filling I use De Trey's Solila gold for about two-thirds of the filling, finishing with moss fiber and heavy foils, and malleting only the outer layers. This method permits of very rapid work and the results have shown me that it is far beyond any other that I have ever tried in the saving of teeth.

Another very great advantage which this method has over the ordinary inlay is that it avoids much destruction of tooth-substance, as it is not necessary to have the opening of the cavity as

large as the inner portion, and I entirely agree with Dr. S. G. Perry in the desirability of avoiding the sacrifice of tooth-substance to the greatest possible extent.

I hope that everyone who reads this communication will give the method described a trial, and if they do, I feel quite sure they will never return to the old method of working gold or amalgam.

Since writing the above I have been looking over the dental magazines and reports which have accumulated during my prolonged absence from London, and in the Transactions of the Odontological Society of New York I find that Dr. J. F. P. Hodson has described a method of "blanketing," as he calls it, a cavity preparatory to inserting a gold or amalgam filling. For gold fillings he prefers several layers of thin non-cohesive gold, and for amalgam fillings (although he does not seem to have used the method for amalgam) he says he prefers tin foil. From my point of view either of these methods would fail to achieve what I have in view, namely, the most perfect joint obtainable between filling material and tooth-wall, especially at the margins of the cavity. The point I would insist on is that there is sufficient substance in No. 60 gold, or gold and platinum, to permit perfect burnishing of the matrix to the enamel margin, and in the case of amalgam fillings, the burnishing must be thoroughly done before the amalgam is inserted. No such effect would be possible with tin foil.

I have never seen the blackening of tooth-substance to which Dr. Hodson refers, where the gold and platinum combination has been used. For gold fillings I greatly prefer the No. 60 gold matrix to several layers of non-cohesive gold, whether the matrix be cemented or not. If the matrix is to be cemented, the great advantages of the thick, co-

hesive gold are perfectly obvious, and if the matrix be not cemented, there is the advantage of having a cohesive surface for starting the filling. But I can see no reason why the matrix should not always be cemented to the bottom of the cavity. A layer of cement under the gold cuts off conductivity, and holds the gold immovably in place while the filling is being completed. Except in very large cavities, I believe that a gold filling by this method can be completed in less time than is required to make a cast inlay, and in large cavities the shrinkage of the metal in a cast inlay leaves a joint vastly inferior to that obtained by the process I have described.

While I have no doubt that carefully made cast inlays will prove very durable, I think the suggestion that they may be burnished to improve the joint is a delusion. Any attempt to burnish the margins of a cast inlay must result in pulverizing the cement beneath, just to the extent that the margin is burnished, and furthermore, the burnished margin is, at best, a feather-edge of gold which will wear or break away, and then the second state is worse than the first.

One cannot too frequently or too strenuously point out that the most important point in the most commonly performed of all dental operations is the perfection of that line where filling material joins enamel. It has been made perfectly plain that decay of enamel is always the result of some imperfection or condition which permits decay-forming bacteria to find lodgment. Any method, therefore, of filling cavities of decay which gives the most perfect union of filling material with enamel margin will, just to the extent of its perfection, decrease the opportunity for the lodgment and action of those decay-producing organisms. I believe that method has been described in the foregoing lines.

J. LEON WILLIAMS.

30 GEORGE ST., HANOVER SQ., LONDON,
September 13, 1907.

PULP-MUMMIFICATION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have read with much surprise in the September issue of the *Cosmos* the article on "Pulp-Mummification" by Dr. F. M. Willis. Any article composed in such a manner as this one, to the mind of any progressive practitioner, should never have found a place in a dental journal. The first statement of the author is that mummification has not been adopted to any great extent because of a lack of understanding of the scientific nature of the operation, etc. Although the procedure, to my mind, in itself is based upon a sufficiently scientific hypothesis, anyone who follows his exposition of the operation would surely fail to observe anything scientific in it.

Proceeding, we find the statement that in many cases pressure anesthesia for pulp-removal is not permissible. As a matter of fact, the question of cases where it is not permissible depends entirely upon the skill of the operator. In any tooth, after proper direct approach to the canals is secured, all of the anesthetized pulp can be removed; for in a freshly anesthetized pulp there is a sufficient inherent resistance, because of the vital vessels and connective tissue which are in the pulp, to allow for its complete removal from even a tortuous canal. This same canal from which the pulp may be removed cannot always be filled exactly to the apical foramen, but if it be carefully reamed out, under aseptic precautions, and the canal or canals flooded with a thick paste of carbolic acid and iodoform, and a gutta-percha point inserted, the apical portion will be so nearly filled with the paste that any remaining unfilled space will be so small as to cause no future trouble. Therefore the limitation of the pressure method depends upon the ability of the operator, as stated before. As to the paste suggested, I can see no improvement over that suggested by Dr. Theodore Söderberg in 1895. The addition of a 20 per cent. solution of formaldehyd,

although this agent is a great preservative agent, would certainly have a tendency to set up irritation. We all know how irritating formaldehyd is, especially in so strong a solution. The addition of iodoform is of doubtful value, with the exception of one possible use which the essayist has overlooked. As an antiseptic iodoform is of no value, and as to pus not forming in its presence, if the pulp were in such condition that future decomposition was to be feared, mummification with any paste is not indicated; the pulp should most assuredly be removed. As to the suggested use of iodoform, there would be the possibility of its combining with the arsenic used, forming arsenic tri-iodid (As_3I_3), which would neutralize any future action of the arsenic. Flooding the canal with dialized iron or with iron sesquioxid one would suggest as the proper chemical antidote. Surely some such agent should be applied before the paste is used. As a bland unirritating agent iodoform is valuable where indicated, but in this connection we can see no advantage in its use.

We are next directed to apply arsenic to the exposed pulp and allow it to remain about a week, sometimes longer, sealed in with cotton dipped in sandarac. Surely we should have a more definite time than about a week or longer. Forty-eight hours should be ample, and certainly no arsenic should ever be sealed in with cotton alone.

The author mentions cases where the gum was badly "stung," as he calls it, and the tooth lost. Of course it would be, if the arsenic was so loosely applied, as he himself informs us he does it, and yet in the very next line he says that carelessness in the employment of so powerful a remedy may result in disastrous failure.

He next states that if the pulp be inflamed, we should reduce the inflammation, then devitalize and mummify. Now, we know that all inflammation is

the result of bacterial infiltration, and if the pulp be infected already, removal of the pulp and subsequent filling of the canals should be the process indicated, not mummification.

He also tells us that if we think there is danger of the arsenic coming in contact with the gum during the application, the gum surrounding the tooth should be covered with cotton dipped in carbolic acid. With apologies to Dr. Kirk, we would ask, "Why not shoot them with a cannon and then kill them some more with a Gatling gun?"

Next we are told, if there be any pain after the tooth is filled, to apply counter-

irritants to the gum and to administer ammonol. We should surely never recommend any professional man to administer a nostrum.

In conclusion we are asked to stimulate study and investigation along scientific lines for the advancement of our profession, etc. With this one heartily agrees. Such being the case, although I have faith in the success of this treatment, we should not allow such a careless presentation of a subject as this to pass unnoticed.

Yours very truly,

MILTON J. WAAS, D.D.S.

CAMDEN, N. J., September 19, 1907.

A SUBSTITUTE FOR PIN FACINGS IN REPAIRING BRIDGES.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The following is a method that I have used in repairing bridges where pin facings have been used, by substituting Steele's interchangeable facings for the pin facings.

Grind the pins flush with the body of the bridge and fit to the latter a backing of one of Steele's interchangeable facings which will correspond to the space. Cement the backing to the bridge; then, with the drill of the S. S. W. anchor

drill set, drill through the backing into the body of the bridge as far as the drill will allow. One hole at each corner will be all that is necessary. Tap the holes with the anchor tap and screw, and insert a gold anchor screw wire into each hole. Grind the wires flush with the backing, and set the facing in the usual way. A repair made in this manner will be neat and strong.

P. NEFF MYERS.

ALLEGHENY, PA., October 8, 1907.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Fortieth Anniversary Meeting—January 1907.

THE fortieth anniversary meeting of the New York Odontological Society was held on Tuesday evening, January 15, 1907, at the Academy of Medicine, No. 17 West Forty-third st., New York city. The president, Dr. W. J. Turner, occupied the chair, and called the meeting to order.

The PRESIDENT. The New York Odontological Society is highly honored in its essayist tonight. Dr. Taggart has been working on his subject for a long time, and he has kept it expressly for this society, and we have been in suspense for several days about this wonderful new thing that he is going to tell us. I take great pleasure in presenting to you Dr. W. H. Taggart of Chicago.

Dr. W. H. TAGGART, Chicago, then read his paper, entitled "A New and Accurate Method of Making Gold Inlays."

[This paper is printed in full at page 1117 of the present issue of the COSMOS.]

During the reading of the paper various specimens were passed around among the members, the first being small carborundum wheels.

Dr. TAGGART. These wheels, you will notice, are mounted on a small shank, and when you fit a wheel to one side or the other of the cavity, the shank is not in the way. These are the shapes you start with, and in their use you will find that certain points shape themselves so that they accurately reach certain parts of the cavity. When you get a

wheel in that condition, do not spoil it by using it on some other point that will wear away that beautiful shape, but use it in that part of the cavity to which it is best adapted. In that way you will accumulate a number of wheels that will be especially adapted for inlay work. You can in a moment's time ruin one by grinding with it a rubber plate or a porcelain tooth.

Now, gentlemen, these are ivory teeth which were carved by students in the dental colleges, and I arranged the cavity preparation. As you will see, there is not a simple cavity here; every one is of quite a complicated shape for which it would tax our abilities to make an inlay by any other process. One of the beauties of the method consists in this fact—that it does not make any difference how complicated the inlay may be, it is just as easy to make as a simple one.

I will pass this specimen around. The filling that is hanging from the chain, as you will read in the descriptive matter, is one solid gold inlay. The cavity preparation is not of such a type as I would use in my practice, but I knew that someone would say, "Can a solid gold inlay for such a case be made by this process?"

This is a wax inlay that I hold in my hand, and which I will pass along with it. I will ask you to be very careful in handling them and in trying to fit them together. I give you my assurance that it fits that cavity. You will see the shape into which this wax

inlay is formed. That was made only this afternoon. Some of the gentlemen who were at the clinic will no doubt explain that part to you. I made the inlay this afternoon from this specimen.

Dr. OTTOLENGUI. This filling is one which I asked Dr. Taggart not to polish, so that you could see the beauty of the product as it comes from the mold.

Dr. TAGGART. This second one is just as it came from the mold. The ball that is on the side of it is the excess of gold that was in the frame. Now we will come back to the real technique of the operation.

I hope that tonight we may set at rest a much-mooted question—one that dentists and dental journals have discussed at great length; and that is the point that you cannot take an impression of a cavity and make a die from that impression, and an inlay from that die, and then have it fit the tooth-cavity. Here is an illustration of it: This is the impression, and into that impression, after it was embedded in a ring of plaster of Paris, the amalgam was worked. After that had hardened, the inlay was made from the amalgam die and molded, and now you can see how it fits the original cavity. That is a very interesting specimen, and I hope it will cut off all argument as to the impossibility of doing it from an impression—because it is just as exact as though made from the cavity itself.

It might be as well to start these two specimens around. As you will notice from the sectional view, they are of rather complicated internal construction. I have made them purposely so, in order to show you the possibilities in such a case by this process. Here are the sections of the tooth into which the inlay was set and which was then sawed through the middle with a circular saw; you can thus see the internal fit.

The next specimen that I pass around is an excellent attachment for a bridge—one abutment of a bridge. You will notice that the cavity preparation consists in passing the carborundum wheel

inside the cavity. This is one of the most effective instruments we can use in the mouth, if kept true, and it can be kept true by a file or diamond chisel. I never think of putting the wheel into the mouth a second time without truing it up. If a wheel be allowed to become but the one-thirty-second of an inch out of exactness, it will cause a jar which is very painful and disagreeable to the patient, but by keeping the wheel true the jarring is avoided.

This method of cavity preparation, you will see, is as simple as possible—that, I think, you will admit. To prepare that cavity in the usual way would require a good deal of work.

The carborundum wheel should be thoroughly wet; by that I mean that a stream of water should be kept on it, because the friction is what causes a considerable part of the pain given in using the wheel.

The cavity is made ready. Three pinholes are drilled with the right-angle adjustment directly down in line with the tooth, away from dangerous territory. Into these pinholes three gold wires are inserted—they fit rather loosely; then, in this process of wax molding, you squeeze the wax down on top of these pins, allowing them to become enveloped in the wax inlay, and by working it in and out, and keeping it chilled, you form the wax inlay just as these other wax inlays have been fashioned. The metal, as you will see, has melted perfectly around these pins.

I could not put on a band or put a single pin into the root of that tooth that will give a firmer attachment than will these triangularly placed pins, one on the back and two on the front margin, as you will see.

Dr. S. G. PERRY. These pins do not melt under the intense heat?

Dr. TAGGART. No, they are made of clasp gold, which admits of a high degree of heat. The sudden influx of the fluid gold seems to weld it, and you will remember that the pin proper is embedded in the investing material, and is not exposed to this intense heat.

Here are two specimens in which I take a great deal of pride. Ordinarily a father is exceedingly fond of his child; he thinks the youngster can do no wrong, and is willing to put up with his peculiarities, because he grows more like his dad every day. After I had perfected this process, I called a friend into my office in Chicago and showed him the process. I said to him, "Take my apparatus to your office, and make a couple of inlays for me to take to New York." These are the specimens of that gentleman's work, and they are the first he ever made. This is the first [exhibiting], and this the second—as the printed matter will show. They are cemented to their places.

Now, in the construction of bridge work we may often meet with a sound molar—a molar without a cavity of decay—and a bicuspid or another adjoining molar missing. Heretofore we have found it exceedingly difficult to get the right kind of attachment on that molar without modeling it for putting on the porcelain crown—I think you will admit that. Take into consideration the fact that this cavity was prepared entirely with the carborundum wheel and the drill for drilling the two holes to receive these pins.

Now I take this diatoric tooth you will see attached here by one chain, and grind it to fit the space, and put a wax backing on it, and after that wax backing is made it is attached to the wax inlay so as to make it one continuous piece; and then the two, as you will see, are molded by this process as one piece. Of course, the tooth is supposed to be later on cemented into these backs. Remember, the backs, inlay, and pins have all been melted and molded in one second of time.

Here is another example of what can be done by taking an impression of a cavity and making an inlay from that impression.

Remember, gentlemen, that the system I am showing you is supposed to be used principally by working from the mouth

—making the wax inlay in the mouth, and not having to take an impression and duplicate it in an amalgam die, or to cement it; but it can be done from an impression if the cavity should happen to be a very difficult one to get at. You could take a good impression of that cavity and work at your leisure in the laboratory later on.

Here are two inlays that were made in just a square piece of ivory. The cavity preparation is very similar to what one might find in a complicated case in the mouth. I have made it in a square piece of ivory so as not to deceive you by carving it to simulate a tooth. One of these was made from an amalgam dummy made from the cavity; the other has been made directly from the cavity, and neither of them has had the touch of a wheel or an instrument of any kind to polish, finish, or burnish them down.

Here is one of the pieces that should possibly have been started around first; it represents the condition of affairs when I first started this molding process. By the most satisfactory process that I could devise or hear of in any way I molded this one from an impression of this amalgam die. I molded it by the only way such molding has been done—that is, by gravity, the weight of the gold being practically poured into the mold. The mold was heated up to the melting-point of the gold in the electric furnace, and the gold was then poured into the mold and pressure made on the top of it by an instrument. Of course the back pressure of the gold squeezing out around the instrument would keep it from having any direct pressure such as mere air-pressure gives. This was the best result I could obtain by casting inlays, and you can see how poor it was!

There are always a number of men in the profession who do not believe in inlays, or, if they do, say they do not. When they are asked about it, they say, "No, I have never started to make them; I make plates." If those members would only make an effort to master the question, it would please me very much.

I now have the pleasure of showing what I think you will admit is something unique. A plaster impression is taken of the mouth, and an ordinary plaster cast made—but a perfect one—such as one from which you would make a rubber plate. Then a sheet of thin wax is softened so as to render it pliable, and is placed over the cast, and with the ball of the thumb or absorbent cotton it is pushed to place, being careful not to render it thinner in one place than in another, but having it of the same thickness in every part. In a rubber plate we have to thicken it up in order to get strength enough; except for that, this piece of wax is put over just as you would when making a rubber plate.

You then make wax clasps just as you would with gold, forming them around the tooth you wish to clasp. Make a wax backing on the tooth that is crowned. You can trim off all the excess—and it is the excess on a plate or bridge that really keeps it from going to place; you cannot force a rubber plate into the mouth if it has not been trimmed away and polished and the excess cut away. Make the wax plate exactly as you wish your finished gold plate.

Here is a gold plate which I will pass around. The plate and the clasps have all been molded out of clasp metal. You know that clasp metal is the most refractory and unworkable material we have. There is probably not one of us who has not tried to use a piece of clasp gold, and if it was thick enough to cut it was too thick to bend, so that by the time it was fitted to place it was visibly thinned down so that it had no more tensile strength than a thicker piece of a more workable material would have. It has been my practice to throw the clasp gold away. Yet here is a plate that has been made from clasp gold by this process.

The next piece is a partial plate with what is known as a Bonwill lug running across the molar.

The next piece is also made of clasp gold. These are backs to be used as dummies in a piece of bridge work. As you

will see, they are thinner than we could possibly make a bridge if we were soldering it, and have any strength, because the solder and 22-k. gold would not be strong enough; but this, being made of clasp gold, answers the purpose admirably.

These two diatoric teeth are made by first taking the impression in wax and then molding them into this form in the machine.

Dr. PERRY. I think you did not state that the little partial piece that is passing around has its teeth riveted on, and it is electro-gilded.

Dr. TAGGART. Clasp gold is not a pleasant-looking gold in the mouth, so that has just been gilded over to make it look better. The tooth is riveted on.

The excessive heat at which this gold is forced into the mold, and the quickness with which it is forced, seems to check the teeth and makes it impossible to get good results. It will mold against the teeth perfectly, but there will be a lot of fine little checks through it, and for that reason I rivet the teeth on. The plate can be made and the teeth soldered on; but for twenty years I have not put a blowpipe on a piece of porcelain tooth. I never think of soldering one; I either rivet or cement it, because of the danger of having it check or break away.

A VOICE. The gentlemen wish to know what the "sprue" is.

Dr. TAGGART. It would be just as well, then, to pass that part of it around. The sprue wire, as it is called, is this little piece of wire that is fastened to the inlay. When it is so fastened it is inverted and put into this crucible form that I pass around. The wax inlay is supported by the top of the sprue. Then, when the flask is put over that and the plaster is poured in here, and allowed to harden, when the two are separated you get this effect [illustrating].

The crucible in which the gold is melted is that little depression, and the form the wire makes in it runs down to the wax inlay; and the wax inlay is inside of that flask. When the heat is

applied the wax oozes into the plaster, and being a pure wax, there is no extraneous matter left behind to clog up the mold.

I have here a specimen that I think will interest all of you. The large gold inlay in front is for just a simple cavity, and is a simple filling, as you will see; rather complicated in its make-up, but very similar to others that I have shown you this evening.

The two molars here, the last molars, have been formed with the carborundum wheel and the same wires that I explained to you in the formation of the others that are now being passed around. These would be used to attach the loose molar to a good, tight molar; or, if it were for bridge work, in case you felt that they would be improved by being bound together.

If you cut a groove from one point to the other and put a wire through, it is almost impossible to work around that wire and get what is the most vulnerable part properly filled.

I have always found it difficult heretofore to make a case wear unless I cut the tooth off and made a crown. In this piece, as you will see, these last two molars may be lifted out, although they are supposed to be cemented to place. I wish to call your attention particularly to the ease with which the cavity is prepared by running the carborundum wheel lengthwise through and crosswise through the front and back. You will observe how nicely that would solve an exceedingly difficult problem in the binding of those two teeth together.

I do not think so much of this next specimen, but Dr. Perry said he thought it showed the possibilities of the process as well as anything I have done. This would be applicable to cases where three or four loose teeth are to be bound together and possibly the bite to be opened. Opening the bite is a difficult thing to avoid when making a single inlay. It is usually remedied by grinding it until you have molded out all the form your inlays had in the beginning.

This piece has been molded directly on the tops of these cusps. These cavities have not been prepared at all. Into each one of these teeth I have drilled one of these pinholes, and into them I have inserted the spring wire, because it is a safe wire. Each one of these teeth has two wires in it. Then the wax is molded on to these just as for the inlays, and the patient allowed to bite. I could have added some more artistic carving, but this was unnecessary. I made this specimen to show you the possibilities of articulation, and if you will look at it from the lingual side you will see what an articulation one can get. It is shown merely to indicate the possibilities of articulation by this method, and the facility with which a bite can be opened.

Dr. W. W. WALKER. We do not quite understand in this section of the room what prevents those pivots from melting.

Dr. TAGGART. They are made of clasp gold, strong gold, and by the time this molten gold gets in to them, there is no time for the pivots to melt. They are cold in the flask. They are in this investing material, where the wax inlay originally was.

Dr. S. G. PERRY. Will you allow me to make just one remark? Gentlemen, you see that is all one piece of gold, reproduced by this single process, done as quickly as a wink. It is not alone that these teeth are all held together firmly in this loose state, in which there is an immense advantage, but it is that the articulation is here reproduced, and it is without doubt better than that of nature itself, as it existed in that case, because there is the distinct print of the upper teeth embedded in the wax and reproduced in the gold. I think that is a very marvelous reproduction, and a vast advantage, because these loose teeth can be treated in that manner so as to make the mouth very comfortable.

Dr. TAGGART. This specimen that I pass around will show you the possibilities of this process for casting. It is not

a dental problem at all. The piece that I pass around will show you the possibilities of molding by this process. It has reference only to the manufacture of jewelry or any piece of fine grade molding where but one piece is to be made from one pattern. It would not do in the manufacture of pieces of jewelry by millions, because that would necessitate the making of steel dies upon which to stamp them out in large quantities; but in the case of a special piece of jewelry, where an artist could carve any form having all kinds of undercuts, he can first form it in wax and then mold it by this process.

This I roll out so as to make a wire of it the size you see here [illustrating], and then, in lieu of any other way of forming it, tie it into a sailor's knot, and then mold it out by putting it in the flask as I would an inlay; the place where the gold enters into it is attached right where the chain is. You will see the possibilities of molding by this process.

I know by this time your curiosity is excited as to the special process by which this molding is done.

Here is a mold similar to the one that is being passed around. The wax inlay is on the inside of it, and the little opening made by that sprue wire is the channel through which the gold is forced down, and the little depression above is the crucible in which the gold is melted.

Now, gentlemen, the compressed air is in this tank. In the modern dental office most of us have compressed air, which of course would eliminate the use of this tank. If you do not have compressed air, you could use a tank of this size, into which air can be pumped with a bicycle or automobile pump, up to thirty pounds pressure. This hose leads to the top of this machine and down to the center of it, where it meets the mold. The mold is then put in position.

Now the nitrous oxid flame is applied and the gold melted. I watch it closely, and when the gold is melted I bring this lever over, which presses the blowpipe out of the way, covers the crucible, and opens

this air-valve. When the gold reaches the right temperature the inlay is cast. The high pressure having been applied after the flame has melted the gold almost to boiling, the lever is switched out automatically.

When I began I had to think, "Now shut your flame off and pull the lever down," and by the time I had thought all this the gold was chilled. This lever arrangement, however, takes it at the boiling-point and immediately forces it in.

Someone asks what investing material I use. For months I experimented with all kinds, of every manufacture, using all my chemical and mechanical knowledge to get one that would not fill with air-holes or bubbles; and I found, after all, that these air-bubbles were results more of the way the investing material was manipulated than any inherent lack of quality in the investing material itself. In other words, we were not manipulating our investing materials and plaster of Paris in the correct way.

You would naturally think, Why not put the wax inlay form in the flask on this little sprue wire, and jar it and jolt it a little; the more you jarred and jolted it, the more, you think, you should get the air-bubbles out. You do so, and when you get through and open the flask you find somewhere in it a great big air-bubble, and you wonder where it came from.

That was because the plaster of Paris or the investing material is thoroughly filled with air-spaces, which, though not dangerous in themselves, yet when they coalesce form larger air-spaces, causing the operator to wonder how they could have been produced in such a carefully prepared mold.

This is Peck's investing material, and I think it is easier to manipulate than any other; but it is the way you manipulate it that really makes the difference.

The inlay—the wax inlay—when it is on this sprue wire is held in the fingers. Now I mix the investing material with water, and without jarring or stirring it I keep adding, through a little fine sieve, the investing material to the water. If

you throw it in in a lump, air-bubbles will form. Gently sprinkle it in and let it sink to the bottom, and then do not stir it at all. The pile that has formed in the center is of one texture; that a little farther down is a little more moist, and that away at the edge is very moist. There are three, four, or six different textures of investing material.

The secret of success here is to take some of that investing material and put it where you do not want it, and then push it to where you do want it. That is the secret of getting rid of the bubbles. It makes it all of a workable texture and of the right consistence. You push it toward these wax margins, and you can see that it has gone into the crevice—just the very place where by jolting and jarring you would have had an air-bubble.

I let that harden for a few minutes, enough to stand up by itself; then, putting it in the flask, I reinvest that by pouring the flask full.

The PRESIDENT. Dr. Taggart before coming here did not tell us to expect anything very great, as he was too modest; but some of his friends did. I am sure we all feel he has more than made good anything that was said of him. What he has shown us has gone far beyond our hopes.

We have another gentleman from Chicago with us—one we have heard before, and whose articles we have all read. It gives me great pleasure to present Dr. Hart J. Goslee.

Discussion.

Dr. HART J. GOSLEE, Chicago. Mr. President, ladies and gentlemen,—While I am a guest of this society, and am exceedingly appreciative of the honor, I hope that you will nevertheless permit me to say that I believe the Odontological Society is to be congratulated upon being the host on this occasion, for it is my honest conviction that tonight marks the dawn of a new era in dentistry.

We thought, with the advent of the porcelain inlay, and subsequently of the gold inlay, that the dawn of this par-

ticular era had been reached; but because of a previous lack of system or of any unanimity of procedure—because of empiricism, if you please—many have worked to develop procedures which might insure such a degree of success as would warrant us in abandoning the methods of the past and adopting those of the present. Almost every man or woman who practiced dentistry became at once more or less interested in these newer processes, and set about with more or less energy, and with that personal equation which goes with every individuality, to develop some method whereby a degree of certainty and accuracy might be reached in the process of making both porcelain and gold inlays; but, until tonight, we have never been able to do this class of work with comparatively any degree of certainty or of accuracy, no matter how skilful we may have been.

There are many distinctive and particularly important advantages in this marvelous method of Dr. Taggart's.

In the first place, his process reduces the construction of gold inlays to a science, or to a system of scientific mechanics. It is hardly possible for one to make anything but an accurately fitting and more or less perfect inlay by this method, and until Dr. Taggart developed this method of forming the temporary wax filling, of making the mold, and then and more particularly, of forcing the gold into the most minute crevices in that mold, we were not able to get any such results. With that statement I am sure you will all agree.

Then, aside from this feature of certainty and accuracy, we are now able to use a degree of fineness or grade of gold which makes our work far more perfect than it has been in the past. Many times since the advent of gold inlays into my practice I have been discouraged with the results obtained from the use of the various grades of solder. Indeed, none have ever been satisfactory to me, and over two years ago I abandoned the use of solder in the construction of gold inlays, and have since been making them entirely of pure gold or 22-k. The objections to solder have been

twofold—there are two principal ones, at least—the tendency toward discoloration and the fact that no grade or make of solder is capable of being built up and contoured into inlays without the presence of pits—both of which objections are eliminated in this process; and, gentlemen, if Dr. Taggart has not done anything else except to insure this accuracy, and to obtain it with a solid high grade of gold, he has certainly accomplished a great deal.

The possibilities, however, are not limited to the construction of inlays. If they were, the method would occupy a most useful place; but it is practically unlimited. He has shown you how it is just as easy to cast a removable bridge involving three or four teeth, or a partial denture, as it is to construct the most simple inlay; further, I do not at all think the possibilities end there, but believe that he will ultimately be able to cast a full gold denture of any size, from the largest down to the smallest.

The fact that he can cast so refractory an alloy as clasp metal gives you an idea of the greater possibilities, and I believe that he can cast 25 per cent. of platinum and 75 per cent. of gold, an alloy which we commonly call platinum solder, as easily as pure gold—in fact, I believe that he can cast anything that can be fused in the mold and with the oxyhydrogen flame as easily as he can manipulate gold.

I do not desire to further take up the time of the society by going into a technical discussion of the paper, because I know there are so many who are anxious to speak upon the subject, but I do want to say this: that we owe, and I think we shall always owe, a great debt to Dr. Taggart.

I am sorry that the dentists of Chicago could not have had this paper and method first, because you know it is natural for most of us to be just a little bit selfish; but since we could not have it first in Chicago, I am extremely proud of the fact that it came from a Chicago man.

Gentlemen, I thank you very much indeed for this courtesy, and in closing

I want to again pay my tribute to the splendid achievements of my friend Dr. Taggart.

Dr. S. G. PERRY. I would not presume, Mr. President, to speak on such a subject as this after the eloquence of the paper itself, and above all the eloquence of the demonstration. There is nothing to be said!—it has all been said, and I can add nothing.

In the past there have been quite a number of methods of making inlays; in the future, I think there will be but one. For a great many years there has been more or less coquetting between the laboratory and the office. They have been on good terms at times, and then they have had little tiffs; then they have come to an understanding again, and there has been a cordial feeling; but there has always been a little lack of sympathy, the office always feeling a little above the laboratory. There has been a readiness to divorce the laboratory from the office. I think they are married tonight in such a way that they will never find a divorce. They are bound in future to go together. There is no question in my mind about that. I think, as Dr. Goslee well said, that this is the beginning of a new era in dentistry.

I saw this afternoon in Dr. Rhein's laboratory an exhibition of this which I think was the most startling, the most gratifying, the most beautiful exhibition I ever saw in my life in dentistry. I think this is one of the most remarkable productions our profession has yet known, and I firmly believe the limits of it are not within the laboratory. We cannot give Dr. Taggart too much credit. He has shown a fine example of persistent American industry and persistent American desire to find out some new way to do something in a better manner. What a marvelous thing it is to stand here tonight, when yesterday we knew nothing of this, and have in just a moment the way made so clear that there is something in it which appeals to the most unimaginative! The beauty of it will be that when the method is perfected, and the apparatus can be procured, there is not one of us who can-

not apply it in such a manner as to get better results than we ever dreamed of before. Therein comes the practical application of such efforts as have been made in years past by Dr. Taggart.

It is that which we need most in dentistry today. There are some men in the profession who will tell you that we are on the downward road, that we are going to the dogs, our literature is of no account, everything is going down, and there is no hope for us in the future. Gentlemen, there is more hope today than there has ever been before. Our literature is in better condition than it ever could have been had it taken any other course than the one it did. As for our laboratories, you see the result. This is the most *eloquent* thing I have ever seen in my life.

Dr. LITTIG. Tonight I hardly know what to say. The slur which has been cast upon the mechanical dentist has at length been removed. I have contended that dental operations were almost always based upon mechanical principles, and tonight a point is reached where we can say, "Look, and see for yourselves." Dr. Taggart has brought specimens before us that show a mechanism, not only for strength but for manipulation and genius, such as we have seldom seen, and now I think that there will be a new era, as has been said—a new epoch in dentistry.

All those hours we have spent in hammering gold into cavities, to sometimes last for three or four months, and maybe not that long, are past, and we are not going to put our patients into any such plight again—to remain five or six hours under the hammer. It has come to a point where we can do it in the laboratory and come back and put it into the tooth; and not only that, but it has passed beyond the experimental stage.

We have at last found a way of casting gold whereby we can overcome the shrinkage which has been our trouble for years. We could cast the gold, but when we had it cast it would not fit on account of that shrinkage.

Gentlemen, I am delighted to be here. I was much pleased to witness the manip-

ulation, and the little clinic I saw today has paid me for remaining with you so long.

Dr. JOHN I. HART. The work Dr. Taggart has shown in the description of his method makes it almost unnecessary for any discussion of this wonderful invention. One of the greatest privileges I have had since I studied dentistry was to see Dr. Taggart outline his method this afternoon. It is going to make it possible for an individual of mediocre ability to perform operations that are of the standard of those of men like Webb and Varney. It is going to make it possible to do operations without that fearful strain on the strength of the patient, on the energy of the operator, and on the life of the pericemental membrane.

Just think of the long operations we have attempted, and then of the fearful strain on the patients in attempting to properly finish down some of those fillings! And to think that Dr. Taggart's invention places us in the position to gain the strength, the contour, the adaptation, and the wearing qualities without any strain on the patient—almost making our work a pleasure!

The dental profession owes a great debt to Dr. Taggart, and when this apparatus is placed in our hands we shall begin to appreciate the wonderful work he has made it possible for us to do.

I thank you for the privilege of paying my respects to Dr. Taggart for the stamp he has placed on dentistry today. He has elevated it.

Dr. RHEIN. It is impossible, after witnessing the demonstration given today by Dr. Taggart, for anyone to fail to realize the value that this method is going to have in the future for the preservation of teeth. It is no new thing for me to stand before this audience and speak in favor of a filling material that shall be homogeneous throughout its entire texture. We all know the difficulty of producing such a result, and we realize this evening the possibilities of removing this difficulty in the future. It is a very proud thing for me to feel that the first public demonstration of anything so revolutionizing as this is

bound to be in dentistry was given today in my own laboratory by Dr. Taggart.

While it is impossible to say much this evening on what is so demonstrable to all, it may not be amiss for me to just say one word in reference to some of the previous history of attempting this very thing. Twenty-five years ago, in this city, that great dentist, Wm. H. Atkinson, spent a couple of consecutive years in the effort to accomplish what has been so successfully done this evening. He was assisted at that time in this work by Dr. Charles Andrews, and it was my pleasure to be present at a number of their efforts to produce this ideal result. These experiments ceased when a nugget valued at about \$1200 suddenly disappeared from Dr. Atkinson's laboratory. He was, however, up to that time, never able to overcome the porous qualities of the casting. He relied mainly on gravity together with the small amount of pressure obtainable from a hand atomizer. I simply introduce this point in the discussion to round out, as it were, the theme, and to recall to many of Dr. Atkinson's friends whom I see in the audience this incident in his career.

Dr. E. S. GAYLORD, New Haven, Conn. I regret that your president has called upon me, for the reason that I feel quite unable adequately to express my feelings and my appreciation of this great invention. I want to make just one remark in addition to what Dr. Rhein has said. He says that the dental profession owes Dr. Taggart a great debt; I go farther and say that the whole world owes Dr. Taggart a debt that can never be repaid.

Dr. OTTOLENGUI. Several here tonight have expressed in one way or another their pride in being in some way associated with this great invention. The society is proud that the paper is read here; Dr. Goslee is proud because the man is from his town, and Dr. Rhein is proud because he succeeded in getting the demonstration away from Dr. Tracy's office and into his own. I am proud to have been one of the first to see this, and I cannot do better than to express to you my first feeling, just as I expressed it to Dr. Taggart in my own

house after looking at these specimens, which I think are the most valuable and important specimens in technique ever passed around in a dental audience. I extended my hand to Dr. Taggart, and I said, "Taggart, you have done something for humanity which has not been equaled in dentistry for fifty years. You have given us a method by which the labors of the dentist will be lessened tenfold, and the pain of operations fifty-fold. You have given us a perfect gold filling, and painless dentistry."

And as you look at these fillings tonight, I ask you if this thought has not often occurred to you in the past—that when you have seen a magnificent specimen of gold foil filling, your highest encomiums have taken this form: "It looks as though it were melted into the cavity"—by which you meant a praise beyond any expectation of realization. Tonight, gentlemen, we have fillings melted into the cavity and fitting there. Those fillings are going to revolutionize dentistry, and I am proud to be a member of the Odontological Society, and to be a friend of Dr. Taggart's.

Dr. W. D. TRACY. It is now something over a year ago that I received a suggestion from Dr. Van Woert and Dr. Ottolengui that the Executive Committee should get into communication with Dr. Taggart.

As a result of this man's true American genius, coupled with his indomitable energy and determination, dentistry, through this society, receives tonight one of the greatest gifts ever presented to the profession.

Gentlemen, we owe to our essayist a great debt, and after all I *am* proud, with the rest of you, to feel that this important invention, bringing as it does, benefit and blessing to us and our patients, has been presented to the world through this society.

Dr. VAN WOERT. I went to Chicago at the suggestion of Dr. Ottolengui and Dr. Kells of New Orleans, to see Dr. Taggart apply this method of making inlays; and I want to tell you tonight—and I will get on the floor at any time, at any clinic, and prove it—that

he taught me within one-half hour how to make a better porcelain inlay than I ever dreamed of making. He will show you how to make a porcelain as well as a gold inlay, just as perfect as anything you have seen here tonight, and by a method which appeals to the patient, to the operator, and to all concerned.

Dr. Taggart made an inlay this afternoon as perfect as anything you have seen here tonight—at a clinic, not in his own office. If this had been done in personal and familiar environments it would have been a different thing. He goes into a strange laboratory—everything about him strange—and produces a perfect gold filling in a little more than thirty-five minutes; and he will do the same thing with porcelain.

He has turned the wheel of dental science completely around. We have entered into a new era. I believe that in five years every gold mallet will be a thing of the past; it will go farther than any cataphoric machine ever went! I believe that in ten years amalgam will be a thing of the past—because you will be able to make a filling so much better than any amalgam filling.

I am only speaking in a general way: You can all do these things—it is not like an intricate operation; if you only understand the man, you can do what he can do. You will be on the top of the ladder with any scientific operator you can find today!

Dr. OTTOLENGUI. Dr. Van Woert mentioned that Dr. Taggart makes these inlays in a little less than thirty-five minutes. Dr. Taggart asked us this afternoon to time him, and it was understood that we would only time the actual demonstration. He was timed by four gentlemen, and two of them made the time for that large inlay that was shown thirty-two minutes. The other two (who had better watches) made it twenty-nine minutes!

Dr. JARVIE. Mr. President and gentlemen,—For years I had become somewhat tired, and my patients became very tired at times, of these enormous gold fillings, particularly in the posterior teeth. Some of the highly recommended processes of

making inlays were more intricate perhaps and consumed more time than putting in gold fillings by the ordinary method; but this method seems to be a most simple one for getting a beautiful, strong, and perfect adaptation of an inlay for the restoration of a large loss of tooth-substance.

It may prove to be like some of the tricks of wizards we see upon the stage—they look so easy when they are explained, and yet should you try to do them yourself you will find they are very difficult. But this process really does seem very simple. It is not one that can be successfully carried out, I imagine, by the careless or unskilful—it calls for the utmost exactness and the most artistic work at every step; yet it seems to me that there is no more skill required than that which any dentist of good ability ought to possess. I think, as has been said by several others, that tonight dentistry has gone a stride forward, and you gentlemen who will live to practice this process are highly favored, and your patients fully as much favored as you are!

The PRESIDENT. Gentlemen, it is not practicable to call upon everyone tonight that we would like to hear; time will not permit. I know that you all want to hear from Dr. Taggart again.

Dr. TAGGART. Gentlemen, to say that this is a proud moment of my life would be expressing it in the very mildest terms. I am afraid I am not in a position to say very much; my feelings might overcome me.

I know I have given you a good thing, but the reception of it has simply been overwhelming. I thank you for your very kind attention, and for the splendid time you have given me since I have been in your city.

Dr. DUNNING. I move that a standing vote of thanks be given to Dr. Taggart.

The motion was unanimously carried, and a standing vote of thanks, with three cheers and a "tiger," heartily given.

Adjournment.

WM. B. DUNNING, D.D.S.,
Editor N. Y. Odont. Soc.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

(Continued from page 1074.)

THE President appointed as the committee to audit the Treasurer's accounts, Drs. G. L. Simpson, W. D. DeLong, and Jos. Huggins.

Dr. H. E. Roberts then addressed the society with regard to the sending of delegates to the Jamestown Dental Convention.

Motion was then made and carried to adjourn until 8 P.M.

TUESDAY—*Evening Session.*

The meeting was called to order by the president at 8 o'clock Tuesday evening.

The first order of business was the reading of a paper by Dr. T. EWING ROACH, Chicago, Ill., on "Conserving the Natural Teeth in Supplying Partial Dentures." After its discussion,

There being no further business for this session, the meeting adjourned until 10 o'clock Wednesday morning.

WEDNESDAY—*Morning Session.*

The meeting was called to order Wednesday morning at 10.30 by the president, Dr. Lippincott.

The first order of business was the report of the Auditing Committee, which was on motion accepted, and the committee discharged.

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

The next order of business was the report of the Committee on the President's Address, as follows:

Mr. President,—Your committee appointed to report on the President's address recommend as follows:

First—In reference to the historical exhibit of last year: That the society express their appreciation of the labors of Drs. Wm. H. Trueman and Edward C. Kirk in preparing that exhibit, by a rising vote, and that they be requested to prepare a report of the exhibit, which shall be recorded in this year's proceedings.

Second—In reference to a Press Committee: That the Executive Committee employ a press agent whose work they shall supervise.

Third—We especially commend to the consideration of the members of the society that portion of the President's address in reference to the Board of Dental Examiners.

Fourth—In regard to the recommendation for the enforcement of the dental law: That the society authorize the appointment of a committee to solicit voluntary contributions through the local societies, and that the Executive Council appropriate \$500 in accordance with the suggestion of the President.

Respectfully submitted,

HOWARD E. ROBERTS, *Chairman*,

HOWARD S. SEIP,

J. A. LIBBEY,

Committee.

Dr. Libbey moved that the recommendations of the committee be taken up seriatim for consideration and action.

Motion carried.

Motion was made that the recommendation of the committee with reference to the historical exhibit of last year be adopted by a rising vote of the society.

Motion carried.

Motion was made and carried that the recommendation with regard to the press agent be adopted.

Dr. Salvas moved that the society request a report from the Board of Den-

tal Examiners each year, in accordance with the recommendation of the committee.

Motion carried.

Dr. Roberts moved that the society authorize the appointment of a committee to solicit voluntary contributions from the local societies to aid in the enforcement of the dental law.

Motion carried.

Dr. Roberts moved that the chair appoint as such committee three members of the society, to have the power to increase their membership by appointing the secretaries of the local dental societies.

Motion carried.

ELECTION OF OFFICERS.

The Secretary then presented the nominations for officers for the ensuing year from the Council.

The President announced that in addition to the nominations presented from the Council the members might make nominations from the floor.

He also announced that a majority of the votes cast were necessary for election.

The society then proceeded to the election of officers, which resulted as follows:

President—P. K. Filbert, Pottsville.

First Vice-president—C. B. Bratt, Allegheny City.

Second Vice-president—W. D. DeLong, Reading.

Recording Secretary—L. M. Weaver, Philadelphia.

Corresponding Secretary—V. S. Jones, Bethlehem.

Treasurer—W. A. Spencer, Carbondale.

Members of Council—Drs. C. C. Taggart, J. T. Lippincott, and E. J. Donnegan.

Board of Censors—C. C. Walker, E. W. Bohn, W. H. Fundenberg, C. C. Taggart, and J. G. Lane.

Motion was then made and carried to adjourn until 4 o'clock.

Afternoon Session.

The meeting was called to order Wednesday afternoon at 4 o'clock, at which

time the clinicians read reports of the clinics given during the afternoon.

Motion was made and carried to adjourn until 8 o'clock P.M.

Evening Session.

The meeting was called to order by the president, Dr. J. T. Lippincott, at 8 o'clock Wednesday evening.

The first order of business was the reading of a paper by Dr. D. W. FLINT, Pittsburg, on "The Loss of Teeth in Childhood, and Its Effect on Occlusion and the Face."

[This paper is printed in full at page 1153 of the present issue of the Cosmos.]

Discussion.

Dr. F. M. CASTO, Cleveland, Ohio. It was with much reluctance that I accepted the invitation to open the discussion of Dr. Flint's paper, because I felt there would be very little for me to say after he had finished. I knew also that what he would say would not be very far from expressing my views. We have been quite intimately associated for the past five years, and our education in orthodontia has been secured from practically the same sources.

The subject Dr. Flint selected to present upon this occasion is a timely and important one. I wish to commend him most highly upon its selection and upon the beautiful manner of its presentation. I do not believe there is a man or woman here tonight who has not learned something relative to the importance of the retention of all the teeth. The most difficult cases of malocclusion that the orthodontists treat are those in which teeth have been lost. It is true, as the essayist has clearly shown upon the screen, that the premature loss of a single deciduous tooth affects in many cases the entire relation of the permanent teeth. The loss of a tooth affects the occlusion in two ways. First, the adjacent teeth lose their lateral support and move toward the space. The teeth next adjacent will likewise lose their lateral support

and move in the same direction. Sometimes all the teeth in an arch will change positions. Second, if the tooth be lost previous to the full growth of the jaw, the development will be interfered with. It is an established clinical fact that the formation of the teeth and their subsequent eruption bear a very close relation to the development of the jaws; especially is this true of the mandible.

In the growth of the mandible there are periods of activity and periods of rest. The periods of activity occur in certain parts that correspond to the formation and eruption of the teeth situated in those respective parts. That is to say, during the formation and eruption of the incisors, growth in that portion of the jaw in which they are located becomes actively stimulated. So also does the same process occur during the formation and eruption of the canines, premolars, and molars.

You can put down as an almost invariable rule that when the first permanent molars are lost before the age of nine or ten years, the lack of development of the mandible will be proportionate to the width of the lost molars. I do not think the essayist wishes to be understood that the teeth are totally responsible for the development of the jaws. That is not true. They are only a unit, and must be combined with health, environment, diet, habits, use, pre-natal influences, and proper nourishment to the parts, to make up the whole.

Regarding the deciduous teeth and arches. In a normal deciduous denture, at five years of age there are spaces between the incisors and canines. This condition usually indicates that the permanent teeth are undergoing a normal process of development and that the jaw is widening for their accommodation. These spaces were first observed by Sir John Tomes, in his investigations published about fifty years ago. Dr. Talbot of Chicago followed up the investigations more thoroughly, and his published articles are of great interest. He claims that the positions of the permanent teeth are influenced to a greater or less extent by the appearance or non-appearance

of spaces between the deciduous incisors and canines. In fact, I believe Dr. Talbot claims that it is possible to determine in no small degree the character of the irregularities in the permanent incisors if the spaces fail to appear. It does not always follow when the temporary arches are normal that the permanent teeth will erupt in normal occlusion. I have observed cases of normal temporary dentures followed by permanent dentures in which malocclusion was evident. So also have I observed cases in which there were no spaces between the deciduous teeth, and still the permanent teeth assumed their correct positions in the arch.

The essayist has given two functions of the teeth. I would add to those the following: To assist in the phenomena of speech; to give shape and beauty to the jaws and face; and to form the inner fortifications against the accidental entrance of foreign substances into the mouth and throat.

The functions of the teeth are very closely allied, and are to a very large extent dependent one upon the other. I believe the most essential function of the deciduous teeth is mastication. This service is rendered at a period in life when it is absolutely necessary that mastication be thorough. It is essential to the health of the child and to the development of the bones and muscles and to all the organs of the body. For what untoward results might not follow malnutrition in a growing child! At this tender age all the organs of the body are being taxed to their utmost capacity, and I know of nothing that will cripple a child's vitality so quickly as a masticatory apparatus impaired by either partial or complete loss of some or all of the teeth. Sometimes I wonder whether or not the deciduous teeth are given due consideration. I have seen a few cases where almost all of them had been lost under six or seven years of age, and it is not uncommon to observe the premature loss of some of the deciduous molars. There is no doubt that in many cases it is almost impossible to save these teeth, but I am rather inclined to conclude from my observations that quite a

number of those that are lost might have been saved by persistent and painstaking operations.

I have observed a marked improvement in speech in a number of cases of malocclusion of the teeth that have been treated. One case in particular was of considerable interest. The patient was a boy eleven years of age. He had a distal occlusion of the lower arch in its relation to the contracted upper arch, with protruding upper incisors, and in addition he was a mouth-breather. The posterior naso-pharyngeal space was filled with adenoids, completely occluding the nares. He had a very bad impediment in his speech, so bad in fact that at times he was unable to utter a word for several seconds. While endeavoring to talk during one of his worst spells he would twist and draw the muscles of his face into all kinds of contortions. The adenoids were removed and the nares properly opened. The orthodontic operation extended over a period of about two years, during which time there was a gradual improvement in speech, the latter continuing until the defect was entirely cured.

As to their giving shape and beauty to the jaws and face: The alveolar process and teeth contribute very largely to the formation of the maxillæ. They are prominently situated upon these bones, and bear an important relation to the establishment and maintenance of facial harmony and contour. Perhaps the extent of this relationship is not fully comprehended until one has had the opportunity to observe the result of treatment in patients with malocclusion of the teeth and abnormally formed jaws, or in patients in whom, after the loss of all the teeth and the subsequent resorption of the process, facial harmony has been restored by artificial dentures.

The attachment of the muscles and the form of the lips and cheeks are more or less dependent upon the shape of the alveolar process and arches. In most people there is a good balance in the upper part of the face; indeed, it is rare to see a person whose nose, eyes, and forehead are not in proper balance. Nearly all of the deformities of the face

—at least a large percentage of them—are in the lower part of the face. The mouth plays an important part in producing the various facial expressions. It is a difficult matter to distinguish whether one is laughing or crying if the face be covered below the eyes.

The essayist has clearly illustrated the evil result upon the occlusion of the teeth and the harmony produced in the facial lines and contours by the loss of a first permanent molar. I know that every man at this meeting is doing everything within his power to prevent the loss of the teeth. I have no criticism to offer on that score, but I do wish to urge the absolute necessity of retaining the spaces when the teeth have been unavoidably lost. This must be done in order to preserve the occlusion and the harmony in the facial lines.

Regarding the age at which orthodontic operation should be made, I am governed by the following rule: Whenever a definite malocclusion of the teeth is established, correction should be made, regardless of the age. This rule applies directly to the orthodontic operation, irrespective of other conditions which might militate against the work being undertaken.

Allow me here, in conclusion, to call your attention again to the axiom of the essayist: "A face is only as nature intended it to be when all the teeth are present and all in proper alignment."

Dr. J. A. GORMAN, Philadelphia. Any one of the five great causes of malocclusion which the essayist has mentioned in his paper could easily be made the subject of a lengthy discussion.

Gentlemen, let me plead with you to study the occlusion of the deciduous teeth of each and every child that comes into your office, because that is the basic principle of orthodontia, and without a thorough knowledge of occlusion the dentist is like a ship's captain without compass or chart trying to reach a distant harbor.

I have in mind at present the case of a dentist who had been attempting for seven years to correct an irregularity in the mouth of his daughter, a case which

could have readily been corrected in a comparatively short time if he had possessed the proper knowledge of occlusion. But as it was, the case was worse when it came into my hands than if no attempt had been made to correct the trouble.

We should urge upon parents the importance of not only filling, but *saving* the deciduous teeth until time for the eruption of their permanent successors, and explain to them the necessity for maintaining proper space in the arches for the reception of the permanent teeth. Approximal cavities in the deciduous teeth had better be over-contoured rather than not have the normal contour, because if there are cavities or flat approximal fillings our little ones will not be able properly to masticate, thus favoring further decay and lack of development of the muscles as well as of the bones of the jaws.

The essayist spoke of retaining even the roots of these deciduous teeth. The orthodontist can better realize the importance of this than the general practitioner, for it helps to retain the proper spaces and aids in the stretching of the alveolus, as the essayist has illustrated by his reference to the wonderful force of the first molar. He spoke of the lip pressure. There is a great deal more to this than any of us realize, as we have so many ill effects resulting from the "lip habit." As to extracting the deciduous canines to make room for the permanent lateral incisors, instead of that what should be done is to expand the arch and make room for the permanent teeth. Often this simple little operation saves both arches from malocclusion.

I shall not say anything of extracting the first bicuspid, inasmuch as the ill effects of its loss have been thoroughly threshed out, and I certainly hope that there is not a dentist in this audience who would advise such a procedure.

The importance of saving the first permanent molar is a well-established fact. This is to my mind the most valuable, the most important tooth of the arch. I am a victim of the odonticide to the extent of having lost my first

molars and I would make any sacrifice at present to have these teeth returned to their proper positions.

Do not be too hasty in extracting deciduous teeth, simply because a parent asks to have the tooth extracted. Parents do not appreciate the importance of retaining these teeth, nor do they realize the ill effects which may result from their early loss—namely, imperfect mastication, by disuse causing pyorrhea and decay; marring of the facial lines; and who can tell how many voices have been ruined by such practice! I myself am handicapped in this respect, as I have not in my mouth sufficient space for the movements in pronouncing certain words and letters. Now, if these precious gems are lost before the patient has reached maturity, we have a problem confronting us in the regaining of these original spaces and restoration of the arches to their normal state. How are we to retain these spaces? Shall we mutilate teeth for the support of bridges? Utility of an organ should be considered first, and always before beauty.

Dr. J. G. LANE, Philadelphia. The general trend of the paper and the discussion which followed was in regard to mutilated cases. Now, it matters little what the irregularity may be, if all the teeth are present the correction is comparatively simple as compared with what the difficulty would be were some of the teeth missing. It is these mutilated cases that really give us our great trouble. The mutilation may be the result of neglect or of lack of proper advice. I have in mind at this moment a condition that we very often find which is a sequel to the manner in which parents sometimes have their children's teeth cared for. Many of these little patients are not taken to the dentist until they have reached an age at which this mutilation may have been committed. It is caused not only by injudicious extraction but also through the loss of teeth by decay. Oftentimes when young children have trouble from toothache the family physician is called in rather than the dentist, and the aching teeth are removed.

The parents think that these little teeth are going to be lost anyway, and that there is no use in attempting to save them, and thus many times deciduous teeth are allowed to decay to the extent of eventually having to be extracted. The physician, as a rule, sanctions this idea. It seems to me most important that there should be some means of conveying information to the physician that will enable him to offer intelligent advice on the treatment of children's teeth.

I have listened with much interest to the discussion this evening, and there is but one statement upon which I desire to speak, namely, the age at which to begin the correction of dental irregularities. I believe Dr. Gorman said that the age at which a definite malocclusion was permanently established was the time to undertake the correction. I should say that the time to correct, or to begin an orthodontia operation, is the very first time and age when the malocclusion is sufficiently pronounced to make it evident that something may be accomplished by its correction.

Dr. G. L. S. JAMESON, Philadelphia. I wish to say a few words from the standpoint of the general practitioner. I practiced orthodontia along with my general practice for a number of years, but I finally came to the conclusion that it was impossible for a man engaged in the general practice of dentistry to give the time and attention that orthodontia patients demand, and so some years ago I began turning over my orthodontia cases to the specialist. If there is any one thing in the conduct of my practice that I regret it is having

extracted some bicuspid, although such was the orthodontia teaching of the time. In no creed or profession can any man be criticized for doing that which is in accordance with the best teaching of the time, but there is no justification for a man lagging behind by reason of his failure to attend meetings and to read the journals. If he is not able to do this work himself, he should put it into the hands of someone who can.

We should instruct the parents about the evils of mouth-breathing in children, as it has to do with the causing of malocclusion long before the child is five years of age, and we should warn mothers that children who do not breathe properly should be taken to the laryngologist. I am a great friend of the laryngologist, because he is able to remove the cause of many irregularities.

This is the age of prophylaxis, both in medicine and dentistry. Prophylaxis to me is not merely the cleaning of the teeth, but doing everything possible to prevent their loss; and it certainly has much to do with the kind of work under discussion.

It seems unnecessary to discuss the question of which teeth should be extracted in orthodontia, as extraction is rarely permissible unless the arches have been previously mutilated by another operator.

Dr. FLINT (closing the discussion). Mr. President, in deference to the other essayist of the evening I will not say anything further on the subject, except to thank the society for the manner in which they have received the paper.

(To be continued.)

CONNECTICUT STATE DENTAL ASSOCIATION.

Annual Convention, New London, Conn., April 16 and 17, 1907.

(Continued from page 1090.)

CLINICS.

Dr. J. E. HEYKE, New Haven, Conn.
"Purifying Scrap Gold."

Dissolve scrap or sweepings in aqua regia by the aid of heat. Evaporate the acid on a water-bath (in a fume-chamber) and dissolve the residue in distilled water. Filter, and boil the filtrate with oxalic acid, when the gold will be precipitated as pure gold. Collect the precipitate on a filter, wash with water, and dry. Fuse the filter with its contents on charcoal—or in an earthenware crucible—with borax until the gold separates as a globule. After this is allowed to cool, warm the globule in a small quantity of sulfuric acid to dissolve off the borax.

Dr. J. W. BEACH, Buffalo, N. Y.
"Saliva Analysis to Determine the Presence of Potassium Sulfocyanate."

Dr. Beach demonstrated the method of testing the saliva for the presence of potassium sulfocyanate which was introduced by Dr. F. W. Low. He showed a specimen of saliva before treatment which took 216 hours to dissolve one-half grain of gelatin. The saliva of this patient after treatment dissolved the same amount of gelatin in 77 hours, the patient having taken one grain of potassium sulfocyanate daily for ten days. Test tubes were also shown to indicate the difference in staining power between the iron subsulfate—or Munsell's—solution, and the iron perchlorid solution, the latter showing a clear and more perfect staining. Tubes were also exhibited to show how different preparations of iron affect the human saliva when administered internally. In cases where the tincture of iron chlorid, which is the

preparation ordinarily given by physicians, is given by the stomach, the potassium sulfocyanate is decreased. But when the organic irons are given, as in such preparations as Ovoferin, no change is noted. This would indicate that it is well to ascertain what preparation of iron, if any, the patient is taking, and to prescribe accordingly.

Tests were made at the clinic, in numerous instances, of saliva which showed an absence of this ingredient, and in several cases one grain of potassium sulfocyanate was given, a test made one-half hour later showing a reaction indicated by No. 2 on the color blank, and a third test one-half hour later a proportionate increase. This demonstrates the rapidity of its diffusion. The test was made by taking 2 ccm. of saliva and 2 ccm. of distilled water, thoroughly shaking them together, adding five drops of iron perchlorid, and again shaking the mixture; the resulting shade, when compared with those on the color blanks, indicated the presence or absence of this agent.

Dr. GEORGE T. BAKER, Boston, Mass.
"Orthodontia."

An orthodontia appliance was shown for expanding the arch and aligning the incisor teeth. It was constructed with the Jackson spring clasps of wire smaller than that usually employed, the gage for the clasps being No. 23. The necessary strength and elasticity were obtained by using platinized gold wire instead of German silver. The advantage of such a small wire is that the occlusion is not interfered with, even when applied to the deciduous teeth. The appliance,

while removable by the operator, is not by the patient; that is, the patient is not aware that it is removable and consequently does not attempt it. It is removed by the operator at each visit, when the patient is instructed to thoroughly cleanse his teeth by means of the toothbrush and powder as usual. The appliance itself is also sterilized by boiling. In certain cases such an appliance has advantages over one attached to the teeth with wire or silk ligatures. The making of the appliance, also the wires and the plate, No. 36 gage, from which it was constructed were shown.

Dr. GEORGE B. PALMER, New York city. "Technique of Taking Plaster Impressions for Orthodontia."

In taking an impression care should be exercised to select a sufficiently large tray, one that will allow at least one-eighth inch of plaster over the buccal surfaces of the molars. Those known as the Angle trays are best suited, as they are much higher than the ordinary tray, and can be bent to conform to the case in hand.

The teeth should be thoroughly cleansed and the membrane freed from mucus by wiping them with cotton. French's impression plaster is dusted into water heated to 93° F. and allowed to settle, when the surplus water should be poured off to get rid of all hard particles. Do not stir or use anything to hasten the setting.

For the upper impression, the plaster should be placed in the tray, flush with the rim, leaving the vault of the tray free from plaster, while the greatest amount is in the anterior portion, extending over the edge on to the handle. Place the tray in the mouth, have the patient close the teeth sufficiently to steady the tray, and bring the plaster in contact with the occlusal surface of the teeth. Raise the lip and by means of the index finger carry the plaster that extends over the rim on the handle of the tray high up and backward over the buccal surfaces of the molars.

The tray is now forced up evenly until all points touch. The teeth will displace

enough plaster to flow over the vault, and thus give a perfect impression of that part. The whole mass is steadily supported with the index finger until it becomes thoroughly set; the harder it gets the more perfect will be the result. The tray is now taken away, leaving the impression in the mouth. All small loose pieces should be taken out with liberal pieces of cotton held in the foil-carrier. Grooves are then cut parallel with the canines, but not quite through. Prize and dislodge the front portion with the point of a knife, and then with the thumb and finger dislodge the lateral portions. This leaves the large piece covering the roof of the mouth, which may now be easily removed. All pieces as they are removed from the mouth should be carefully placed on a clean piece of blotting paper—a great many pieces do no harm, provided all are saved. After it is thoroughly dry, the smaller pieces are put together with celluloid cement or liquid collodion, the larger with wax, and if this be skilfully done, the line of union is hardly noticeable.

In a like manner the lower impression is taken, being careful to observe the essential points above mentioned, especially that of carrying the plaster—which has been built up and outside of the rim on the handle of the tray—well down between the cheek and teeth before forcing the tray home. When the plaster has sufficiently hardened, remove the tray and wipe out all small pieces of plaster with absorbent cotton. Coat with vaselin a piece of gauze about one inch square and place it on the impression lingual to the incisors, and introduce new plaster to form an index of this surface. When hard, remove this index, and use it as a key when assembling the impression.

Dr. N. A. STANLEY, New Bedford, Mass. "The Use of the Matrix."

In demonstrating the use of this very simple matrix which I have used for many years, let me say there is nothing very new or original about it. In coronal approximal fillings, where the adjacent teeth are in position, it is invaluable in my hands. A piece of matrix metal,

say German silver No. 36 or 40 gage, is cut sufficiently long that when it is placed between the bicusps, for instance, the ends can be pressed and burnished to the labial and lingual surfaces of the teeth, to form what might be termed a half-ring. Two small holes made with a plate punch in opposite corners enable you to use the matrix around the neck of the teeth, which aids the operator in the adjustment by holding it in place. Insert a little wedge opposite the cervical margin of the cavity. This holds the thin sheet of metal in close contact with the tooth to be filled, and will admit little or no surplus in finishing off. Burnish the matrix against the adjacent tooth from the cavity side. Warm a "gob" of gutta-percha base-plate and stick it on to the

buccal surfaces of the teeth, molding it into position with the thumb and finger. Do the same on the lingual surfaces of the teeth. This holds the matrix in contact with the tooth, thus giving a cavity with four walls, against which the filling is built. Of course this is all done after the dam is in place. If the sides of the teeth are coated with a solution of resin or sandarac, the base-plate will stick all the better.

With the cavity prepared and the matrix adjusted, I consider the operation half done. I now fill the cavity from one-half to two-thirds with soft gold foil, and finish it with cohesive gold. The malleting and wedging of the foil will afford all the separation required, and will leave a nice contour which will knuckle against the adjoining tooth.

MASSACHUSETTS DENTAL SOCIETY.

Forty-third Annual Meeting.

THE forty-third annual meeting of the Massachusetts Dental Society was held in Mechanics Hall, Huntington ave., Boston, Wednesday, Thursday, and Friday, June 5, 6, and 7, 1907.

FIRST DAY—*Afternoon Session.*

The meeting was called to order at 2 o'clock, Wednesday afternoon, by the president, Dr. Murdoch C. Smith, Lynn.

The reading of the minutes of the last annual meeting was upon motion dispensed with, they having been published in the printed Transactions.

OFFICERS ELECTED.

The secretary, Dr. C. W. RODGERS, then read the report of the Council to the effect that the following members had

been elected as officers of the society for the ensuing year:

President—George E. Savage, Worcester.

First Vice-president—Ned A. Stanley, New Bedford.

Second Vice-president—Cornelius S. Hurlburt, Jr., Springfield.

Secretary—Chas. W. Rodgers, Dorchester.

Assistant Secretary—Robert Whitehill, Cambridge.

Treasurer—Joseph T. Paul, Boston.

Editor—Carl R. Lindstrom, Boston.

The amendments to the constitution and by-laws, as announced in the program, were then taken up and adopted.

REPORT OF COMMITTEE ON DENTAL MEDICINE.

Dr. G. B. SQUIRES, chairman of the Committee on Dental Medicine, presented the following as its report:

The committee felt that the most important

phase of dental medicine at the present time was the proprietary question, and that we were lagging a little behind—indeed, a great way behind—the medical profession, and in fact behind the laity, and therefore that something should be done; and that if the committee called the attention of this society to the general inactivity in the dental profession in regard to this matter, the society would be only too glad to take some action in regard to it, so that we could stand on a plane with the medical profession and the laity, and show that we were doing our part toward the checking of this great proprietary evil.

Your committee believe that this society should take some action in regard to the dental proprietary evil. Fully seventy-five per cent. of the remedies advertised to the dental profession are nostrums, that is, remedies whose formulas are either withheld from publication or are wrongfully stated. No profession can call itself learned that uses and prescribes secret remedies. We should be as particular to keep unethical remedies out of our exhibits as we are to keep unethical practitioners out of our society.

We therefore recommend that all remedial and prophylactic preparations allowed space at the Massachusetts Dental Society's exhibits must comply with the following rules:

Rule 1. No such article shall be admitted unless its active ingredients and the amounts of such ingredients in a given quantity of the article be furnished. The general composition of the vehicle, its alcoholic percentage, if any, and the identity of other preservatives, if present, must be furnished.

Rule 2. If the trade name of an article is not sufficiently descriptive of its chemical composition or pharmaceutical character, a descriptive title must be included.

That a permanent committee be formed whose duty it shall be to enforce these rules, and that all such articles be approved by said committee before they are granted space.

That an appropriation be made so that the committee may have analyzed for verification any submitted formula, if for any reason they consider it expedient to do so.

Respectfully submitted,

G. B. SQUIRES, *Chairman*,
CHARLES W. RODGERS,
GEORGE H. WRIGHT,
Committee.

Dr. R. A. BUSH, Worcester, moved that the Massachusetts Dental Society adopt the report as read.

Discussion.

Dr. A. J. FLANAGAN, Springfield. I am somewhat in accord with Dr. Squires, although I wish to question one statement he has made. He has said that we are far behind the medical profession. I would ask for some information. Boston is a large, enlightened city, and I would ask Dr. Squires if at the meeting last year, in the city of Boston, of the American Medical Association, which is the representative body of the medical profession, they did not allow the very same things in their exhibit that are criticized here at the present time—and if the medical profession, as a profession, is not as badly off in this respect as we are as a profession? The statement is made that, as a profession, we are behind the medical profession in regard to quackery and nostrums. I question that from the standpoint of the good of the profession of dentistry. I am in accord with what Dr. Squires is trying to do, but I do not think it is for the best progress and best for the future reputation of dentistry to make the statement that we are behind the medical profession as regards quackery and nostrums in general.

I can and will refer to the various editorials in the *Journal* of the American Medical Association, the members of which society have complained bitterly of the lack of true ethical principles governing many practitioners of medicine, and of the large amount of advertising which was anything but ethical accepted by many medical journals. I wish emphatically to call Dr. Squires' attention to this one great fact: The *Journal* of the American Medical Association is only one of many periodicals representing medicine, and when he speaks of the advertising of nostrums by certain dental journals he should at least be fair enough to state that there are more than a score of medical journals—accepted journals of standing—which advertise freely that which he condemns in dentistry. This seems to be Dr. Squires' specialty, and I, as a member of the dental profession, would like to know if

truthfully and honestly it can be said that we are one bit worse off than the medical profession. I have always thought that medicine had never been granted a license to throw stones against dentistry for the shortcomings that Dr. Squires speaks of.

Dr. H. C. MERRIAM, Salem. This is of course a very interesting question. It represents a movement begun some years ago, which has gradually reached the surface like the battle of the elements on the lake; as the high wind striking the water causes the manifestations on its surface, so we see this idea of public intelligence governing everything that enters into life—we see it in Washington; in the various health reports of every state, in the chemical investigations of the purity of milk; and all over the country. It is seen all through mechanics, all through literature, not confined to America but extending the world over.

Of course the first thought of a man before he puts money into a venture is what will be his title to it after he invests his money in it; he must see himself safe before he puts money into it. Therefore he says, first, This must be my own. Then of course you will see that with the money feature entering into the manufacture of drugs, those who are financially interested naturally enter these enterprises with the commercial spirit—with the desire to put their hands over a thing and say, This is mine. Now, the greater part of the country's invested wealth is behind these things. Money controls investigators. Money controls the journals—and they send out most excellent literature. But where are we? What has dentistry done meanwhile? What journal reflects the professional feeling common to every profession? Where do we find it? What dental student is trained in the schools to make various antiseptic washes? What school does it? Are there a dozen physicians who can write the prescription for a detergent mouth-wash? How many dental professors are able to write the formula for a simple detergent wash? How many can write one for a simple tooth-powder? We all know that some of the proprietary

preparations are wonderful preparations, and they harm our profession, in that when a man begins to buy a good thing, and knows he can get it at any time, he begins to lose interest in the subject of its composition and pharmacology—that is why we have such a narrow view of dentistry. But is that the intelligent way to deal with the subject of these preparations? I remember, when some years ago I was an instructor at Harvard Dental School, I saw a tooth one afternoon turned a beautiful green—beautiful as a specimen of green, but in a patient's mouth a most horrible sight. That was done with a proprietary article bought from some dental depot. It was not the work of one man; it was put out by a company, of which a prominent dentist was the president.

I have no doubt that you will find similar blunders in the medical profession, perhaps, but I think we should have the means for correcting the defect in our own. It can be done through the board of registration by enlarging the examination, and in the schools by insisting that the requirements in materia medica shall be up to the proper standard. Lots of us have patients who think that the dentist only fills and extracts teeth. Many of them think that the dentist does not have the care of the functions of the body, and they will continue to think so until we demonstrate that dentistry is taking its place among the healing arts; that the function of dentistry is physiological and hygienic, and that while filling teeth is a part of it—indeed, a very great part of it—it is not all of it, by any means.

Dr. P. K. BROWN, East Milton. I think that the Massachusetts Dental Society should have some advantages in it. I have been a member of the society for four years, and there have been a great many laws passed here that do not seem to give the members as much freedom as the practicing dentist enjoys who is not a member, and I think these little matters are to be taken into consideration. With the many restrictions placed upon our members, I think dentists are fully as well off who do not belong to the society,

and perhaps a little better. After a dentist has been experimenting and spending money and time on any tooth-powder or preparation, I think he should have the privilege of selling that, just as would any other man. I do not think we ought to take that privilege away from him, and do not believe we give our members the opportunities that they would have if they did not belong to the society. I am only one, but that is my idea, and if anyone here can convince me to the opposite, I am willing to change my views.

Dr. SQUIRES. I am surprised, not to say astounded, that Dr. Flanagan should say that the American Medical Association has not done any more than we have in regard to this matter. I supposed that everyone knew that the American Medical Association has been working along these lines for over two years. Two years ago it formed a Council on Pharmacy and Chemistry, composed of fourteen members, and every advertisement of a medicinal character before it is given space in the journal of the association has to be approved by that council. Every exhibit at the meetings has to be approved by that council, and they are also now getting out a book of non-official remedies, and every article mentioned there must be approved by the council. The council has ten rules that must be conformed to by every exhibitor at the meetings, and by every advertiser in the journal. The first rule says: "No article shall be admitted unless its active medicinal ingredients, and the amounts of such ingredients in a given quantity of the article, be furnished for publication. The general composition of the vehicle, its alcoholic percentage, if any, and the identity of other preservatives, if present, must be furnished." This first rule would throw out three-fourths of the remedial preparations that we have exhibited here. Dr. Simmons told me that glyco-thymoline was not approved by the committee, and could not get into the exhibit of the Medical Association, and we have many others. Of course some ethical men use these things, but the American Medical Association will not

allow a preparation to be exhibited or advertised in their journal unless the ingredients, and the amount of the ingredients in a given quantity of the preparation, are given, and I challenge anyone to prove otherwise.

Here is a letter that I received from the editor of the American Medical Association *Journal*:

January 25, 1906.

Dear Sir,—Replying to your letter of the 22d inst.: All medicinal preparations must be approved by the Council on Pharmacy and Chemistry of the American Medical Association before they can be admitted to the advertising pages of the *Journal*.

We are carrying a few that have not yet been approved, on account of unexpired contracts, although I think none that have not been temporarily approved by a committee of the council.

The council investigates each preparation—not necessarily making a chemical analysis, however—using their judgment if they have the slightest suspicion that the statements made by the manufacturer are not correct.

I am glad to know that the dentists are taking up this fight against nostrums. I have no doubt they are being duped as much as the medical men and the public have been.

I would very much like to know the result of your analysis of Sanitol and Glyco-thymoline. We have not published officially our analysis of the latter. We are not carrying the advertisement at the present time, because it has not received the approval of the Council on Pharmacy and Chemistry.

The same rules will apply to the exhibitors at the meeting of the American Medical Association that apply to the advertisements in the *Journal*.

We do not make analyses for other societies.

Very truly yours,

GEORGE H. SIMMONS.

Now, if there were in the exhibits of the American Medical Association any nostrums or any preparations that did not give their ingredients, and the quantity of the ingredients in a given amount of the preparation, I would like to know about it to report it to the editor. I think in this way the American Medical Association is doing more for the elevation of the medical profession than all of the trade journals put to-

gether, and it is lifting the profession to a higher and higher plane every year, by sanctioning only ethical preparations. Considering that the trade dental journals are not taking up this fight, we must work through our society. I want this society to stand on the same plane with the American Medical Association, and say that we demand as much as they do.

One of the gentlemen spoke of restrictions. Does he not believe in checking this evil? Does he believe in using ethical preparations, or does he believe in using nostrums which are secret remedies? When we use the latter we are no better than the laity, and are prescribing in the dark. Did Squibb when he discovered a method of separating cocaine from the coca leaves, keep it a secret? No, he gave it to the profession. This firm make no secret or trade-name goods; everything is open and above-board. Their capital is their name and the reputation they have earned for making high grade pharmaceutical preparations. If any dentist has a tooth-powder—anything that is worth considering—the exact formula should be given, and I contend that we are not professional when we use these secret preparations.

Dr. FLANAGAN. Dr. Squires has misunderstood me. I said that I was in accord with what Dr. Squires was trying to do; but I made the statement, and I now repeat it, that I went carefully over the exhibit of the American Medical Association last year for the specific purpose of comparing their idea of a medical exhibit with that of the dental exhibit. Dr. Squires has not a more hearty worker on the question of nostrums than I am, but I do not like to hear people continually harp on the idea that dentistry is going to the dogs and that medicine is in the seventh heaven of perfection, because *it is not true*.

Dr. Squires happened to be present when I read an article on the same subject at a meeting of the Metropolitan District Dental Society held last winter in Boston, and if I did not state the truth, it was his duty to condemn my statement. I am in accord with what he is trying to accomplish; I shall vote for

it and work for it, but I do not think it is for the best interest of our profession for any of its members to be continually making statements, involving an invidious comparison between the medical and dental professions, that the facts do not bear out. There are men in the medical profession, lots of them, who use unethical preparations—that we do know; and I again make the statement that some of the so-called nostrums—things that we are led to believe are nostrums—were exhibited at the meeting of the American Medical Association in Boston last year. They were there, and Dr. Squires saw them. I simply want a fair statement of the truth when we compare dentistry with medicine.

Dr. MERIAM. I do not think that dentistry is yet in position to be absolutely exclusive regarding these preparations. Questions relating to the various materials and directions for making pharmaceutical preparations are published in the pharmaceutical journals and in the medical journals—information relating to materials entering into practice—but so far as I know, matters of this character are not printed in any dental journal as they are printed in the medical and pharmaceutical ones. This work is now before us, and not behind us. We have men in the dental schools who cannot compound a tooth-powder; that is a condition to be overcome. In regard to the question of discovering wonderful tooth-powders, and similar preparations, these things appear very simple to those who know about them, and as long as we consider these things wonderful that are simple, I do not see how we can escape the charge of ignorance.

Dr. SQUIRES. Dr. Flanagan says nostrums were exhibited at the meeting of the American Medical Association: Probably his idea of nostrums and mine may not agree, but I would like him to mention any particular one.

Dr. FLANAGAN. Pardon me; I said preparations that were *considered* nostrums by some—that we are led to believe are nostrums.

Dr. SQUIRES. They are not nostrums if their formulas are submitted and the

quantity of their ingredients; if this be done, of course they are allowed to exhibit them. And we will be willing to do the same thing. Let them give the quantities of their ingredients; we do not ask for the technique of manufacture, but, as the American Medical Association does, let us require that they give the active ingredients and the quantities, and I maintain that there is not one preparation seen on the exhibition floor of the American Medical Association that does not do that. We have many that could not be exhibited at the American Medical Association's exhibit.

Dr. Ray's motion to adopt the report of the Committee on Dental Medicine was then carried.

The President announced that he would leave the appointing of the committee to carry out the recommendations in the report to the incoming president.

The next order of business was the reading of the President's address. Dr. G. E. Savage, first vice-president was called to the chair, and Dr. M. C. SMITH read his annual address.

The next order of business was the reading of a paper by Dr. G. B. SQUIRES, Somerville, entitled, "Dental Medicine."

After the ensuing discussion the session adjourned.

Evening Session.

The meeting was called to order by the president, Dr. Smith, at 8.30 o'clock Wednesday evening.

The first order of business was the reading of a paper by Dr. H. C. FERRIS, on "Antiseptic Treatment of Pathological Conditions of the Oral Mucous Membrane."

[This paper is printed in full at page 1132 of the present issue of the COSMOS.]

Discussion.

Dr. EUGENE H. SMITH, Boston. I would like to ask Dr. Ferris if he considers all cases of pyorrhea to be curable. I have always felt that in many cases there is a systemic condition underlying

the disease that works against a cure even if the instrumentation treatment be carried out as thoroughly as may be possible.

Dr. N. A. STANLEY, New Bedford. A year and a half ago or more I had the pleasure of spending an evening with Dr. Ferris in his office, and he very kindly showed me his method of treatment and his set of instruments. For a long time I have been very much interested in everything promising to be of assistance in the treatment of pyorrhea. Anything that would help us in the matter I think we should consider very carefully. I have followed Dr. D. D. Smith's treatment. I have a set of instruments, a part of the set designed by Dr. Ferris, and I have found them extremely useful in the treatment of pyorrhea. They are not unlike the instruments designed by Dr. Smith—perhaps a little different in shape, but they have the thin blade and the drag-file surface, and in my hands they are most useful in the scaling of teeth. I am treating a great many patients for pyorrhea, and while I cannot say that there is any cure for the disease, I do think that I am holding it in check; but in many cases that is about all I can do. In some cases, where it is noticed in its incipient stage, I think I cure—that is, prevent further development—where perhaps only one or two teeth have become affected, by having patients come to my office for treatment whenever I send for them. That is the way I handle my cases. I keep a list of these patients and have it understood that they are to come for treatment whenever I send for them, and they are only too glad to be relieved of the responsibility. My secretary makes the appointment when it is time for them to come—once a month, or once in two, three, or six months, as the case may be. Any man who treats pyorrhea should have control of his patients or he cannot expect good results. Thorough instrumentation is of course the secret of any success in the treatment. I have been using the compressed-air spray for the past two years, and I find it to be a very valuable adjunct in

connection with this treatment. Dr. Chas. Tozier of Boston was the first in my knowledge to prescribe this treatment and I have found it to be a most excellent thing. First carefully scale the teeth as thoroughly as is possible, and then polish them with the porte-polisher. I have a number of these polishers—those designed by Dr. Smith to hold small orange-wood points; also a very excellent one designed to carry a shoe-peg, and made, I think, by Dr. H. B. Harrell of Texas. Of course in polishing under the gum a thin wedge point must be used. I have been trying for some time to find something that would thoroughly polish approximal surfaces. There is a specially prepared silk for this purpose, but it wears out very quickly. I have been using thin celluloid strips made from the films used in taking instantaneous photographs. I cut them into narrow strips; in many cases I find them most serviceable. Although the strip does not carry the pumice as readily as the silk, it is especially good in polishing the interstitial spaces, and it wears an indefinite time. Those interested in this line of treatment might find it worth while to try these strips.

I have been surprised at the beneficial results obtained by this systematic scaling and polishing of the teeth. The gums respond very quickly to the treatment; they become less congested, much firmer, and assume the more natural pink color. I have gradually adopted this form of treatment and am now a firm believer in it. The more you practice it and the more expert you become with it, the more beneficial will be the results. I have enjoyed very much listening to the paper, and I think we should all make a thorough trial of the instruments Dr. Ferris has presented.

Dr. G. F. EAMES, Boston. I was very much interested in the very admirable paper which Dr. Ferris presented, and especially in his experiments with collapsible tubes or syringes. About fifteen years ago I had some syringe points fitted to collapsible tubes for the purpose of affording something that could be placed by the patient, as well as by the

operator, between the teeth, and that would remain there overnight or longer, and render that portion of the mouth as nearly aseptic as possible, in order to thus prevent decay. I abandoned the idea, or at least did not pursue it any farther, because, the point to be carried between the teeth being small and the ointment of such a consistence as to remain in place for the required time, it required considerable pressure to force it into the spaces, often causing the tube to burst under pressure. About five years ago, in my experiments in the treatment of so-called pyorrhea, I devised what I called an ointment syringe, in which to carry an ointment, or any plastic preparation, to be forced to the bottom of a pyorrheal pocket. The syringe was supplied with a screw with which the ointment was forced into the pockets, and as it required considerable force, according to the consistence of the ointment used, several of the points burst on account of the pressure which had to be applied to drive the material out of the tube. I had a number of these syringes made, and several New York men used them, but I do not make very extensive use of them at the present time. In very large pockets, however, I admit that such an instrument can be used very successfully.

I have been interested for a long while in the shapes of instruments for this work, and have devised a few; perhaps some of you remember those that I presented several years ago at the New York Institute of Stomatology, and also before the Massachusetts Dental Society, in the form of a clinic. The surfaces of these instruments cover a large area of the root, and their shape being like that of the drag file, they will catch a good many minute particles that would not otherwise be touched.

Dr. H. A. KELLEY, Portland, Me. I was very much interested to observe, while in New York recently, how much prophylaxis is practiced there. In fact it is being practiced very generally, and I think that any dentist without the compressed-air outfit and not using these sprays will find that he is very much be-

hind in his methods. We are doing something to prevent decay; we are doing a great deal to stop the terrible ravages of pyorrhea, and in many cases I believe we are curing this disease.

I have in my practice the case of a man who for years had been having his teeth cleaned once a year, but who notwithstanding this precaution was gradually losing them through pyorrhea. I placed him under a prophylactic treatment, and after one year that man has today a good mouth—not a “mouth beautiful,” but in a far better condition than the average mouth that is free from pyorrhea.

My method of handling these cases is very much the same as that described by Dr. Stanley. I keep a list of all the patients receiving this prophylactic treatment, and they are sent for at the time I wish to see them, usually once a month. They have nothing to do with the question of deciding when the work shall be done; they put themselves into my hands, and I control the cases entirely.

I understand that Dr. D. D. Smith of Philadelphia says that he can prevent by means of this treatment ninety per cent. of the caries that would otherwise occur. While such may be the claim of an enthusiast, yet supposing that we prevent only forty per cent. of the cases, it would certainly be far better than to wait for cavities to appear and then to patch the teeth up. I am confident that we can prevent a great deal of caries and that we can cure more cases of pyorrhea in this way than by any other treatment known to me. I think all dentists meet with cases of pyorrhea which they feel they could have prevented had they seen them several years previously. But if we expect to accomplish any beneficial results with these cases we must keep at them continually, and we must polish, polish, and polish—that is the secret of success in this work.

Dr. EAMES. The question of the cure of pyorrhea, it seems to me, hinges on the degree of advancement of the disease. When the statement is made that a cure has been effected, let it be known

clinically just how far advanced the case was, and then we may come to some definite conclusion as to the prognosis in a given case.

Dr. STANLEY. The more work you do along the line of prophylactic treatment the greater degree of efficiency you acquire in combating this disease. I have cases of children whose parents had pyorrhea, and there has been every reason to believe that the disease would sooner or later assert itself in the mouths of some of the children. In two very marked cases where the evil tendency was beginning to make itself felt, prophylaxis at regular intervals was practiced, and it is now keeping those mouths in a healthy, comfortable condition. I believe this systematic polishing of the teeth and treatment of the gums—giving them strength and health—is producing a condition in which teeth will become less prone to the ravages of decay. I believe this is one of the coming methods in dentistry, and that prophylaxis is going to take a prominent place in our practices, and eventually everybody will have to be able to employ it intelligently.

Dr. H. C. MERIAM, Salem. It seems to me that we can differentiate these cases in many ways. First, that condition characterized by resorption of the alveolus as it occurs in people as they grow older, and which may be accompanied by pyorrhea or not. This senile alveolar atrophy occurs at a little earlier age in women than in men. I think that in this connection we have to consider those cases in which the molar teeth have been extracted, especially the first molars, causing the six anterior teeth—which in women will keep their places up to about the age of forty years—to separate. That is a condition that, as far as I know, I have not noted in men before the ages of fifty, fifty-five, and sometimes sixty years. Then I think the chronic cases, or the results following chronic cases, should be considered separately.

Then, again, I think we should allude to the part that nature plays in improving the conditions of the mouth after a prophylactic operation. It seems to me that after such an operation we find a

greater degree of cleanliness than the amount of work we have done would seem to account for.

Speaking of instruments, I think there was one advantage in the Riggs instruments, which are now entirely out of use, and should be out of use, and that was their direct angles; so that the person working with one of them could carry in his mind exactly where the point of that instrument was working, even though it was out of sight. Of course some of the instruments shown tonight possess this feature, but I think I have worked with greater satisfaction, as a rule, with those whose points have been at a given exact angle than I have with curved instruments. Those which I use today have considerably smaller blades, and the contrast is almost humorous when compared with some of the larger instruments that still remain in my case.

There is a method of forming instruments to the proper shape for any use in cleaning the teeth, and that is to use a great many very small broken-back hoes and hatchets, preferably the small hoe, and in that way can get the advantage of the direct angles, and they can be carried to any point of the root with accuracy, thus rendering very easy the operation for the removal of calculi. I take one of these hoes, and grasping the blade in a small pair of pliers, hold it over the flame, heat it, and then bend the shank, keeping the blade in the pliers, to any desired curve. The instruments are then allowed to cool in the air, thus rendering them of the proper degree of hardness.

Some years ago a lady of, I should say, about sixty or sixty-five years of age, came to me, and said, "I hear, doctor, that your patients do not lose their teeth, and I want you to take care of mine." I thought then that she was expressing the views of very liberal minds, as you can imagine, but she has been a very willing patient, and I am very glad to say that in the course of three or four years her teeth have been entirely cured of pyorrhea by means of the probe and caustic treatment familiar to all.

Dr. C. W. RODGERS, Boston. There is one phase of the paper that appeals very much to me; that is, the medicinal treatment rather than the mechanical. It seems to me that the profession is on the verge of a more serious consideration of preventive dentistry; and in this connection the investigations on the sulfo-cyanates of the saliva appeal to me directly.

I attended the meeting of the New York State Dental Society and there listened to the report of the Committee on Scientific Research, and their report proved to my mind that sulfo-cyanate has a great influence in the mouth with reference to the prevention of decay and the general tonic condition of the oral mucous membranes. That report said, if I remember rightly, that when the saliva is deficient and when there is a marked predisposition to decay, if we administer one-fiftieth of a grain of sulfo-cyanate once a day, at bedtime, for a week or so, we shall get the saliva in a good healthy condition, and under these conditions there will be little if any decay. It seems to me that that is a very important discovery and we should all endeavor to develop it farther.

I remember speaking to Dr. R. R. Andrews some time ago about using materials to prevent decay, and he told me that he had been trying to do something with calcium lactophosphate, experimenting with it in cavities where the pulp was nearly exposed, and said that several years ago he had cemented calcium lactophosphate in a cavity having an exposed pulp, and that when two or three years afterward he cut out the cement he found a thick, hard layer of dentin over the pulp. It seems to me that these points in connection with the use of potassium sulfo-cyanate and calcium lactophosphate should be of great use to us.

Dr. FERRIS (closing the discussion). It has been very satisfactory indeed to me to have the subject discussed so fully. I will attempt to answer some of the questions asked. Dr. Smith raises the most difficult question to answer, when he wants to know whether pyorrhea is curable. I think that a surgically un-

clean mouth is the greatest field for medicine today. Constitutional disease is due in a large percentage to auto-intoxication, and is the result of pathological conditions of the oral mucous membrane and the organisms it breeds. We find that in these pathological conditions the mucous membranes change and secretions differ chemically. This field is so large and complex that it causes us to hesitate when we attempt to analyze the saliva for its chemical constituents. I am convinced that in proportion to the hygienic condition of the mouth, so will the general condition of the physical system be found.

Dr. Talbot of Chicago has directed our attention to a diagnostic factor that has been overlooked, namely, blood pressure. Whenever we find the blood pressure below or above the normal we find disease present and the mucous tissues changed, and when we come to treat these conditions, if we expect to correct them we must bring about a normal condition of the circulation. The lack of blood supply to any of the organs must necessarily result in disease. If we do not have sufficient blood supply we have a prematurely senile condition.

With regard to the work of Dr. D. D. Smith, many of us cannot afford to devote the time to our patients that he does. He brings about normal results without drugs and his treatment is ideal. But the majority of our patients cannot afford to pay a thousand dollars for treatment when they have interstitial gingivitis, so we have to hasten the treatment, and I have accomplished a great deal by supplying to the system the chemicals that render the saliva normally antiseptic.

Dr. Meriam mentions the fact of his patients coming to him for operations and afterward returning with their mouths in a better condition than when they were operated upon. That is perfectly true. The psychological effects upon the salivary secretions are indispensable. We see something that is good to eat, and it makes our mouths water; that is the result of reflex action from the optic nerve, stimulating the salivary

glands to excrete saliva, and the same thing applies to operations about the mouth. If you jab the gum continually you must have a continual reflex upon the glands to supply mucin to cover that part, or if tartar be the irritating cause the same is true. These glands finally become broken down in their efforts to relieve the part from bacteriological action. If we administer potassium sulfocyanate we will find that that viscid condition of the saliva will disappear. In a week's time we can bring about that result. We may then stop the potassium treatment for a week or so, and make tests of the saliva, and find that the acid units have dropped from 5 to 1 acid index. This simply shows the mechanical action of the glands in throwing out this sulfocyanate into the saliva, and it acts upon the medium in which the bacteria grow the best; and if the chemical be not an antiseptic, yet it is a solvent of this medium, or albumin, and if we get rid of the substances on which they grow we must necessarily decrease the quantity of the bacteria and consequently the acid products. We may find a patient complaining of loss of appetite under this treatment, and in that case it is best to alternate, giving the treatment for one week and then discontinuing it for a week. After this treatment we shall notice the mucous tissues becoming more normal in color. A stimulation of the blood supply also stimulates metabolism, but you cannot cure these cases, any more than you can cure an abscess without removing the cause, if you do not reach the constitutional conditions that may have been minor at first but ultimately become major. I believe that is what we have before us. You may get rid of the irritants, the calculi that appear from time to time, but above all you must correct the constitutional condition.

I thank you very much, gentlemen, for your attention.

The next order of business as announced by the President was a paper by Dr. C. T. STOCKWELL, Springfield, on "The Relation of Diet to Interstitial Gingivitis."

[This paper was printed in full at

page 808 of the August issue of the *Cosmos*.]

Discussion.

Dr. G. F. EAMES, Boston. The idea of masticating the food properly has been given considerable impetus in recent years, and I will not take up your time to add to what Dr. Stockwell has said in his excellent paper with regard to the contests between vegetarians and meat-eaters. There is no question whatever of the great importance, as indicated in the paper, of the matter of diet in changing the physical conditions—in keeping up the physical standard; the important point is the method of dieting—the intelligent method. Very little is known today of the *modus operandi* of food in its several metabolic changes from the crude state into the various tissues of the body, therefore the most intelligent medical men of today differ in their directions to patients in regard to diet. In my office yesterday a patient said to me that he was changing his diet, and that it was benefiting his health greatly. He said he was *gradually* changing his diet—that he was now drinking only a teaspoonful of coffee at each meal, and that he was going to eliminate it entirely. I asked how long he had been in making the change. He said, "About a month," and I said, "You call that gradual!" It ought to take years for this. Things which you have been accustomed to for years should not be eliminated in a month.

Dr. H. C. FERRIS, Brooklyn, N. Y. My thought has been in the direction of normal occlusion of the dental organs and the study of tooth-forms. I think these two suggestions of the greatest importance, and any man who stops to think of them will see that that statement is correct.

The essayist in speaking of Dr. Fischer's experiments showed that those men who selected their own diet reduced the proteid substances five-sixths. These men in three months' time doubled their physical efforts by tests. They masticated their food until it was swallowed as saliva, this being one of the require-

ments of the test. I believe this recommendation to be beneficial in any diet, but the use of sugar, as now recommended by some medical men, even in New York and Boston, to my mind is pernicious, some of them recommending the use of candy even to the extent of a pound a day. These scientific gentlemen might just as well eliminate ptyalin from the saliva, and dispense with the liver in the human system, if our present knowledge of the function of the liver be correct. Such recommendations to the public are suicidal.

In the consideration of the pathological conditions of the mucous tissues there are two distinct phases to be considered; that of the chronic and that of the acute. In acute conditions more attention should be given to the local conditions. The removal of the cause of the trouble, if the cause be constitutional, is most necessary, but the local cause is in the nature of a local irritant, and is within our grasp. I think our first service is to remove the local irritating cause and to have the medical attendant assist us in the constitutional consideration of the condition, whether we admit that condition to be the initial cause or not.

Dr. HORACE L. HOWE, Boston. I wish to express my appreciation of Dr. Stockwell's paper. I think that in the diet of our patient lies the proper treatment of pyorrhea alveolaris. In this relation I wish to quote from the writings of Hippocrates: "Excessive food causes disease, and at the same time points out the remedy." Even in Hippocrates' time it was known that excess of food caused disease, and that the elimination of the cause was the best method of arriving at a cure of the disease. And I think, as Dr. Stockwell says, that in the removal of the cause we have the best possible treatment for pyorrhea, and for many other ills.

Dr. N. A. STANLEY, New Bedford. In a case of pyorrhea that came under my treatment there were a number of pockets continually discharging pus, with the characteristic odor of pyorrhea. I treated the case for a few months, scaling and polishing the teeth and using the

sprays. The patient came in one day and I was amazed to note the improved condition of his mouth. I had not been treating the case very long, and was not quite ready to think that my efforts were responsible for the condition that was visible. After some conversation the patient told me that he had given up the use of meat and had adopted a vegetable diet almost altogether. There was an absence of pus, and an absence of that characteristic odor that we get in bad cases of pyorrhea. I have seen the patient several times since, and the same condition prevails, and I am satisfied that this improved condition is largely due to the vegetable diet.

Dr. STOCKWELL (closing the discussion). I do not see that any further re-

marks are called for from me. I would simply say this—that each of you will do yourself an injustice if you do not pay some attention to Professor Chittenden's book on the subject under discussion.

Dr. KINSMAN. I move that a vote of thanks be given to Dr. Ferris for his paper presented this evening, and also that a vote of thanks be extended to our good Dr. Stockwell for his paper. It is some time since we have had the pleasure of hearing from Dr. Stockwell.

The motion was carried, and a vote of thanks was extended to Dr. Ferris and to Dr. Stockwell.

Motion was then made and carried to adjourn until Thursday morning.

(To be continued.)

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-ninth Annual Meeting.

(Continued from page 1064.)

FIRST DAY—Afternoon Session.

THE afternoon session was called to order at 2 o'clock by the president, Dr. W. A. White.

The first order of business as announced by the Business Committee was the reading of a paper by Dr. NELSON T. SHIELDS, New York, on "The Treatment and Filling of Root-canals."

[This paper was printed in full at page 1044 of the October issue of the COSMOS.]

Discussion.

Dr. JOHN I. HART, New York, N. Y. The removal of pulps and the treatment of root-canals may be an old subject, but so long as there are so many ways and means of treatment it will never become a hackneyed one until more uniform methods of treatment are adopted.

Today no body of dentists meet and discuss this topic without there being almost as many methods suggested as there are individuals present. After all, it is the thoroughness of our technique that leads to success in our treatment of root-canals. I shall not take your time in enlarging on many of the suggestions the essayist has made, but will satisfy myself, even if I do not the members present, in calling attention to and if possible emphasizing a few of the points which he has so ably made.

He very properly states that in opening up a tooth through the surface to the pulp-chamber he uses new and sharp instruments, thus avoiding the overheating of the tissues, and minimizing the pain to the individual. When opening a tooth that does not possess a cavity it is necessary to stone off the surfaces before an

attempt is made to use steel instruments, and when the latter are used, it is essential that they shall be sharp.

The essayist says that he uses carbolic acid for sterilizing root-canals. Personally I prefer a preparation of alcohol forty parts, formalin twenty parts, and oil of geranium forty parts. This, however, is merely a matter of preference, and I do not doubt that Dr. Shields obtains equally as good results as I do.

He speaks of the temptation to immediately fill the root-canal after removing the pulp. When a pulp is removed under pressure anesthesia there are no means of knowing that it has all been extirpated unless it has been taken out in one mass. If a small particle of the pulp becomes detached from the main trunk, there is danger of leaving that portion in the canal. In addition, as there is more or less hemorrhage in such cases, it always seems wise to place a dressing in the canal and proceed with the final filling at a subsequent sitting. I always make a habit of using an electrically heated wire or the Evans root-dryer before introducing the medicament into the root-canal, so as to desiccate the surrounding dentin as thoroughly as possible, thus increasing absorption by the dentin surrounding the root-canal. I prefer to fill the root-canals with tin points rather than with gold, as the author suggests. The tin points can be worked up to the apical opening with a greater degree of ease than can gold, by cutting the points as we would the gutta-percha point, so that they will fill the apical opening as perfectly as possible. In filling the body of the canal I prefer aristol and zinc oxid equal parts mixed together, and finally remixed with zinc chlorid rather than the plain zinc oxychlorid. In working the mixture of aristol and zinc oxychlorid into the canal I find that I am assisted by capillarity after the walls of the root-canals are moistened with the zinc chlorid. The canal should not be flooded but merely moistened with this drug.

The essayist's warning against the use of any form of drill in enlarging root-canals, except in the anterior teeth when

the crown has been cut off and we are to insert a dowel or post—that is, where we can have direct access to the canal—I consider very timely. It is most embarrassing to the operator if the drill is broken off, and the danger of breaking off a drill, particularly if we work by means of the engine, is extreme. I think when operating on bicuspid and molars we hesitate about breaking down enough of the crown portion of the tooth to enable us to gain access to the root-canals. It may be extremely unfortunate in certain instances that we have to sacrifice so much tissue in order to obtain access to root-canals, but access must be had. After all, what we want is a healthy root, and if to gain that we must remove more of the crown than would seem justifiable, I say, let us do it. We try to conserve too much coronal tissue in operating on roots.

The essayist has emphasized the necessity for thorough removal of the pulp tissue. If we are not thorough in this part of the operation, we shall find that the pulp tissue will eventually break down and give rise to an abscess or to chronic pericementitis, and as the result a necrotic area at the end of the root.

I wish to congratulate Dr. Shields on the clear and concise manner in which he has presented the subject.

Dr. R. M. SANGER, East Orange, N. J. In undertaking to discuss Dr. Shields' paper I find myself reminded of a little incident which occurred last year at Buffalo. The Sage of the Roycrofters was talking to a crowd of us, and related a bit of experience that rather illustrates my position today. He said he had been buying what was called "nigger-head" stones, and finally they gave out and he could get no more. His head man came to him and said, "Well, we have got the whole crop." The Sage said, "What! Do you mean to tell me that stones grow?" The man answered, "Certainly," and took him out to a corner of a fence and showed him a boulder, and said, "I dropped that there out of my vest pocket when I was a boy, and it has taken forty years to grow that big." "Well," said Mr. Hubbard, "you know you cannot argue

with a man who has a fact." (Laughter.) And so I feel that Dr. Shields has come to us with a series of facts which we cannot discuss but simply have to admit, and I think Dr. Hart is timely in his most intelligent discussion of the subject of root-canal filling. A gentleman once said, in reading of dental meetings, that probably we would never have anything new; that the only successful meeting was a clinic where new materials and new methods were presented—forgetting the large body of dentists at that meeting who had never been there before, who were listening to things which while they may have been old to him were new to them.

I disagree with Dr. Shields in advocating the filling of root-canals with gold. I cannot get gold up to the apex. By breaking up roots of teeth for purposes of investigation, I have found that in many teeth there is a contraction of the root-canal at about one-sixteenth or one-eighth of an inch from the actual end of the root. As we explore the canal with our eyes shut, so to speak, suddenly the apex becomes narrow and the broach stops, and we conclude that the end has been reached, but in those contracted canals such is not the case. You are not within one-sixteenth of an inch of the end, and as you pack gold there you do not know but that you are one-sixteenth of an inch from the apex. Dr. Shields will say, "Gentlemen, I know when I am there from the results. I know from the cases that are cured, that I have an absolute percentage of success." Perhaps he may, perhaps his method is all right, but there is a school which teaches the non-filling of root-canals. They teach that the pulp-canal must be thoroughly sterilized, that the pulp-chamber must be hermetically sealed, and the canal remain open. I know most of you gentlemen will raise your hands in holy horror at such a thought, and say that it cannot be done, and yet these men prove that they are correct by the percentage of successes, omitting the percentage of failures—which does not prove anything at all. It is hard to condemn any one method in any other man's hands, and it is also dangerous to condemn any

method of another man who has had success with it.

Personally I have recourse to chloro-percha and aristol, and as my cases *always* succeed—except those which the other fellow has to bother with and that I do not see—I keep on practicing, with a percentage of success that seems to warrant me in hanging on to almost the first method I learned of filling root-canals.

Dr. A. P. BURKHART, Buffalo, N. Y. I am very much pleased with the paper which Dr. Shields has presented, but I am not exactly in accord with him on some little points which he has offered. But it is by these little disagreements that we bring out that which is most useful to us.

Dr. Shields tells us, in attempting to devitalize a pulp in a tooth in which there is no cavity but which is to be devitalized for esthetic purposes, that he can pass through the dentin until very near the pulp without causing pain to his patient. Like Dr. Hart, I think the correct way of approaching dentin is to first grind off the enamel by means of suitable stone-wheels, which certainly is a painless procedure, but that Dr. Shields is able to drill through dentin, the sensitive portion of a tooth, and not cause pain to the patient, is a surprise to me, and I would like to learn the trick. Perhaps the patients which he has in New York are a little different from those which we have in Buffalo. It may not hurt Dr. Shields' patients to drill through sensitive dentin, but it does mine. My method consists in first making a slight opening in the crown, and then under cocain-pressure anesthesia to reach the pulp-chamber.

Too much emphasis cannot be placed upon thorough sterilization, thorough work in root-filling. Dr. Shields has brought out the idea very beautifully that where we wish success to follow we must avoid the temptation of filling the root at the first sitting where we have extirpated the pulp under anesthesia rapidly induced. I think the greatest misfortune that ever befell me was in the early use of cocain, followed by immediate root-filling. I now follow the plan

which Dr. Shields has suggested. I consider that the method he has given us for obtaining the length of the root-canal is unique and worthy of consideration.

The filling of root-canals with gold and tin I attempted years ago, but did not meet with that uniform success that Dr. Shields evidently does, but—like the speaker who preceded me—there are men who make a success of a special kind of instrument or a special method which in the hands of another man equally as particular, but perhaps not so skilled with his fingers, will simply prove a failure. Many years ago I discarded tin and gold and adopted chloro-percha, and its use has been satisfactory.

Dr. Shields has emphasized most thoroughly that in the cleansing of root-canals only broaches should be used. I follow that rule. I believe great damage is done in many instances in the use of root-canal drills, and take the position that where a root-canal is large enough to admit a drill, the drill is not needed, and where the root-canals are tortuous, of course it is entirely out of place. Therefore with broaches we can more carefully and thoroughly do our work than with drills. I had a little experience day before yesterday of which I am reminded by the subject under discussion. At a dental depot I noticed a set of drills for root-canal work, intended for use in the engine. How any man can possess the degree of skill to use those drills and follow the shape of the canals is a marvel to me. Possibly it can be done, but I have never been able to accomplish it.

As to molars and bicuspid about to become the seat of abscess, Dr. Shields gives us some advice. A method I have followed—and with success—consists, after opening an abscessed tooth, in forcing into the root-canal by means of a syringe copious amounts of water as hot as the patient may be able to bear. Having observed the therapeutic methods followed at a sanatorium where diseases are treated by the free use of water, and having noticed the success of the hot-water cure in various diseases, I began to experiment with hot water in the

treatment of alveolar abscess, and found that it was very beneficial. For that reason I use hot water freely, then, after adjusting the rubber dam, I cleanse the canals, as Dr. Shields suggests, with sulfuric acid and other medicaments. I have been very much pleased with Oxpara as a dressing in cases of alveolar abscess. I think that if we would all carefully digest and follow the rules laid down by Dr. Shields for the treatment of teeth from which the pulps have been removed under cocaine-pressure anesthesia, or even of those that may already be the seat of abscess our efforts would be rewarded with more uniform success.

Dr. E. H. BABCOCK, Brooklyn, N. Y. I much appreciate what Dr. Shields has said, yet in my opinion mechanical antiseptis is a very important factor in the treatment of most devitalized teeth. It consists in the careful and thorough cleaning out of all the decomposed organic matter in the canals by means of drills and broaches.

I do not agree entirely with the speaker who opposed the use of the drill. It is a question of carelessness in the use of this instrument as to whether we shall have trouble afterward or not. If we work in the canals recklessly trouble will follow, but if the operator manipulates his instruments gently, has a clear track to work in, does not use too large a drill, or the chip-blower too frequently, he will have little trouble. If you find a tooth that has been devitalized for some time, and in which the tubuli are saturated with disorganized organic matter, with a Gates-Glidden drill ream out carefully all of the debris, and in the long run you will be benefited by the use of the drill, providing you are careful not to force any of the organic matter through the apex.

Dr. JOSEPH HEAD, Philadelphia, Pa. I greatly admire the technique as presented by the essayist, although I have never attempted to fill root-canals with gold. But there is this one point to be considered in the filling of root-canals. If we leave the tips of the root unfilled we are apt to have irritation and septic inflammation. It has always been my desire to fill the root-canal absolutely

to the tip. I have felt that going through the gum, cutting off the tip of the root, filling the canal and smoothing over the end of the foramen, is the only method by which we can be practically sure of a perfect operation. When we leave a certain amount of pulp-material at the tip of the canal, as we do invariably when we use only the broach and go as far as we can, there will always remain a condition to cause irritation and perhaps absorption of the tip. Thus by filling a canal in the defective way I have described, the root may become absorbed and possibly the filling material be projected into the gum tissues. I have seen some very interesting radiographs of root-canals filled with gold, showing the gold sticking out of the canal into the gum. This condition produced a constant tendency to absorption. This is, in my opinion, a decided objection against the presence of gold at the tip of the canal.

I had a number of cases of abscess where I had to reach to the top of the root through the gum. I filled the entire root-canal with gutta-percha and smoothed off the tip, and yet I found in the course of a year or two, by means of the X ray, that there had been continued absorption, and in spite of my previous care a little tip of the gutta-percha appeared sticking up through the gum, which to all appearance seemed to tolerate it without difficulty. I had another interesting case of this kind some years ago, when I was more interested in implantation than I am at present. I had decided to implant a tooth in the following manner: I took an old root, adapted a Logan crown on it, and attached it by means of gutta-percha, which was also used for filling the root-canals. I then implanted the tooth, which in the course of four years became loose, and in five years had to be taken out. I then found that half of that root had been absorbed, and that the platinum pin, covered with gutta-percha, was sticking in the gum, in which tissue to all appearances it had caused no disturbance whatever. From that time I have felt that if such a thing were possible, it would be a much safer process to get a little too far with the

gutta-percha through the root-canal than not far enough.

I have recently derived satisfaction from the use of a set of drills known as the Beutelrock canal drills. These come in assorted sizes from No. 1 to No. 6, which is as large as would be used in the largest root-canal. My method is to co-cainize the pulp in the usual way and then, with the smallest drill, drill into the canal until the instrument sticks. When I pull it out, I have loosened the pulp at the tip, and in many instances the whole pulp comes out on the drill. Having done that I follow it with larger canal drills, until I have reamed out a considerable portion of the tooth-structure around the pulp-canal. In that way I have taken out the larger portion of the pulp, and have free access to the canal. Having done that I sterilize the canal thoroughly and fill it with gutta-percha. That is an anti-septic operation. Before filling the canal, however, I take a small portion of iodoform paste and force it up into the root until the patient feels it, and then you know that it has reached the apical foramen. I would say, however, that in the use of these canal drills I have broken some of them off occasionally. I have no universal standard for success, and feel that I would actually scorn never to fail, because I should not give my patients the benefit in desperate cases of the chance of success.

Dr. SHIELDS (closing the discussion). Dr. Hart tells us that he fills the apex of the canals with tin points. The discussion of the methods that followed leads up to this point, that if the canals are cleansed to their respective apices, in any place where you can place an explorer you can also place a flattened Donaldson broach, and the point of the Donaldson instrument is the exact diameter of the apical foramen; and you have an instrument that will never go past the apex, but will go to that point and stay where you put it. If you fill the canal using an extremely small instrument the instrument will go through the apex. It is astonishing how easily and quickly you can puncture the apical region. After the root is cleansed, the

instrument being flattened, by merely attaching a little piece of gold the width of the shaft of the point and about an inch and a quarter long, you can carry the gold very readily to the apex with ordinary pressure, and without giving the patient one single sensation of pain.

Dr. Head says that he carries the point up into the canal until the patient flinches. He does not know when he reaches to the end until the patient feels pain, but on the other hand, you do not want to have any pain at all. When you carry the gold you can carry it to the exact spot without the patient experiencing the least degree of pain. There is absolutely nowhere else for the gold to go; it has to get to the spot. If the apex is small you can use a small plugger, and there is no danger of carrying the gold through the apex, and you cannot keep the gold from going where you wish it. By removing the instrument you then have the apex absolutely measured and the gold carried to the end. Root-canal filling is a surgical operation, and when the patient experiences pain we know what the matter is, and do not have to guess at it as physicians sometimes have to do. And I would say to Dr. Hart that he could carry a piece of gold to the apex with more ease than he can the tin.

In reply to Dr. Sanger, in filling the root-canal with chloro-percha, after the root is cleansed to the apex and the chloro-percha is carried to the point where you wish to fill, what is there to prevent you from forcing the material beyond the apex?

Dr. Burkhart said that he would like to know how to puncture the tooth-structure from the canal to the pulp without giving pain to his patient. He said he would like to learn the trick—I think those are the words he used. Instead of stoning the enamel, you can take any small bur, flattened on both sides so that it becomes a drill, and with

it it is possible to penetrate through the enamel and dentin painlessly. As soon as you have reached the dentin, continue the work with a sharp bur. Do not go at it too rashly, but with the lowest speed on the engine, by simply holding your instrument to the dentin, it will go through—and it will go through painlessly. Gentlemen, I am satisfied with this method. I know what it is absolutely; if not I would not be willing, as I did, to go before the representative men of New York city and give four clinics. There is no particular trick, except true, easy manipulation, and if there is the least particle of sensation with the large bur, use a small one before you plunge it into the pulp-chamber.

Dr. Head said that he did not have sufficient technique to carry the gold to the apex. If he would persevere in this method in the slightest, he would be able to do it without trouble. Dr. Head has laid himself open to criticism in saying that we always leave pulp-remnants in the canal. I do not leave pulp-material at the apex, and if you are careful not to leave anything in the pulp-canal, only exceptionally will you experience difficulty in reaching the canal to the end. Don't be satisfied with using one instrument in cleansing the canal; use half a dozen. And so I say to Dr. Head that you do not have to leave any débris in root-canals, and instead of carrying the gutta-percha beyond the apex, I place the gold in the exact spot indicated by the instruments. You cannot carry gutta-percha through the apex unless there is an opening there, and if you are careful in cleansing the canal you will never go beyond that point, and you will not have the trouble Dr. Head speaks of, of the gutta-percha extending through the apex, but you will have the latter absolutely and perfectly closed. I thank you, gentlemen, for the discussion of the paper.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

EDWARD C. KIRK, D.D.S., So.D.

PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States. Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, NOVEMBER 1907.

EDITORIAL DEPARTMENT.

SHALL WE NATIONALIZE OUR NATIONAL ASSOCIATION?

IN our October issue we published an interesting and significant paper, entitled "The Value of Association," by the president of the National Dental Association. This paper was read before the last annual meeting of the Dental Society of the State of New York, and was followed by a discussion which was important for the reason that it brought out the expression of two distinctly opposite views as to the question of professional association among dentists, and the method by which that desirable condition of affairs should be brought about. The author of the paper made it quite clear that the views presented by him were those which he held as a private dental practitioner, and were in no sense to be taken as an official utterance by him in his capacity as president of our national body. Giving due regard to this well-defined attitude of the author of the paper in question, it is nevertheless a fact that his views as a practitioner must necessarily also coincide with his views as chief

officer of our national body, even though they were unofficially expressed; hence it is that his position as president gave an added and important significance to the arguments and the plea for a larger interpretation of the ideal of professional association which his paper sets forth.

We are in agreement with the entire position portrayed by Dr. Peck, and in full sympathy with his contention for a larger development of the association principle in the minds of the profession at large. It would be a work of supererogation to attempt to add anything to the forceful arguments which he has adduced to emphasize the importance of associated effort in dentistry for the betterment of the individual and the improvement of the craft. Indeed, it can hardly be considered necessary, for are not these facts self-evident propositions? Does any intelligent dental practitioner today really believe that nothing is to be gained by himself as a dentist, or by his profession as a department of human activity, from the attrition of ideas that grow out of professional association as its natural result? History and experience furnish the all-sufficient answer to those inquiries, and the individual who thinks otherwise is either too young, inexperienced, or ignorant to have an opinion upon the subject worthy of serious consideration, or else he represents the opposite extreme of fossilized senility.

It is not, however, the major question as to the value of association that is at issue. Those who do not believe in the uplifting and educative value of associated work and effort are in so small a minority as to be practically a negligible quantity, and it is therefore safe to say as a general proposition that the importance and value of association in dental professional work is practically unquestioned. The uncounted local, state, and other dental societies throughout the civilized world are the unanswerable proof that this is so.

But, while no difference of opinion exists as to the desirability, even the necessity, for professional association, a wide diversity of ideas exists as to how the good effects of association can be best attained, and this difference of view was clearly brought out in the discussion following the reading of Dr. Peck's admirable paper, the discussion relating itself almost entirely to the question of the National Association; and it furnished a presentation of

two opposite types of ideals as to what the scope, purpose, and function of our national body should be. As viewed by Dr. Ottolengui, the National Association should be essentially a representative body in the broad meaning of that term; that is to say, it should be in a national sense representative of the whole body of ethical dental practitioners in America, and its organization should be planned and executed with reference to establishing and maintaining such a representative character. On the other hand, the contention voiced by Dr. Butler was that the National Association should be a sort of professional Mecca to be reached by the faithful after having strenuously worked their way along the devious pathway leading through the guarded entrance of the local or district society to the state society, and then out through the narrow doorway of limited delegateship into the National;—a sort of modern pilgrim's progress ending in the National Elysian Fields where professional association, purged of the grosser elements of ignorance and unethical conduct, may blossom in an atmosphere of high scientific endeavor and bear its fruitage of mutual admiration and self-glorification, and where the emoluments of office shall be parceled out among the faithful *ad infinitum*.

We are not disposed to think that this latter state of affairs was just what was intended to be accomplished by the limited delegate plan advocated, but we are strongly inclined to believe that something of that sort is more than likely to eventuate from its longer continuance. The limited delegate plan is defective in several respects as applied to our national body. Theoretically it may appear to be selective in its effect upon the character of the membership, but practically it is not—at least it is not selective of any more learned or better trained or more efficient type of membership than is to be found in many other more democratically organized dental societies with less pretentious relationships. We deem this to be so because the character of the literary and scientific output of the National Association as compared with that of other organizations shows few, if any, distinguishing marks of superiority; or, otherwise stated, other dental societies are doing equally good scientific and literary work. Therefore the limited delegate plan is not, in its practical application, sending into the national body a distinctly superior type of membership.

But the most important defect in the present plan is that as a result of its workings the National Dental Association is not nationally representative of dentistry in this country, either geographically or numerically. Nor is it representative in actual output of work as it would be if organized upon the higher and larger basis of association so clearly set forth by Dr. Ottolengui in his discussion of Dr. Peck's paper.

It is time, and high time at that, for us to study this important question with a riper judgment than has heretofore been brought to bear upon it. The history of the association impulse in its national aspects and expressions is a matter of historical record in the archives of our profession. We are launched upon larger times and in contact with broader and greater interests than those dealt with by our professional predecessors. We have passed the period when our national dental interests can be truly represented by an organization that tends to partake of the attributes of the Inner Mystic Shrine of the Ancient Elevated and Ennobled Order of Apostles of St. Apollonia. Our national body should be the heart of a system that would send its pulse-beats of professional stimulus out to the very ends of dental life in this whole broad land. The practical, successful example of how such an organization of associative effort having a working plan of high efficiency may be produced is furnished us by the plan under which the American Medical Association has been successfully reorganized, or the plan under which the British Medical Association has more recently been reorganized. Our problem is simple enough; it is merely necessary that we recognize the need for a new and modern definition of our ideal of association;—the rest is easy.

WHAT HAS BECOME OF IT?

FOR quite a number of years—a greater number, perhaps, than those unacquainted with the history of the subject would be likely to realize—the subject of legislation with a view to establishing an organized dental service in connection with the Army and Navy has been agitated. Committees have been formed, meetings have been held, money has been spent, bills

have been prepared, introduced, and lobbied partly through Congress, and the dental profession has from time to time been encouraged to believe and hope that the object of all of this activity was about to be realized. But what has become of it?

The discussion of this question occupied a large part of the time of the meeting of the National Dental Association at Atlanta in 1906. The committee was at that time reorganized and the expectation aroused that something tangible and satisfactory in the way of accomplished results would quickly follow. If anything was done during the following year we have been unable to learn of it; nor does the report of transactions of the Minneapolis meeting, as far as we are able to learn, indicate that any report from the Committee on Army and Navy Dental Legislation was received or considered by the meeting. Is it not high time that a report either of progress or of disability was forthcoming? What has the National Dental Association to show to the dental profession in the matter of results for the expenditure of time and money that it has made on this vitally important work?

REVIEW OF CURRENT DENTAL LITERATURE

Conducted by JULIO ENDELMAN, D.D.S.

[*Province Médicale*, Toulon, July 6, 1907.]
TREATMENT OF DENTAL HEMORRHAGE. BY DR. M. GUIBAUD.

The severity of dental hemorrhage depends on a series of factors, local or general in character. The local are: Congestion of the gingival and periosteal tissues; degree of traumatism inflicted, and nature of the anesthetic used. The general or systemic predisposing causes are: Idiosyncrasy, age (extreme youthfulness or old age), such pathologic states as cachexiæ, disturbances of the liver, hemophilia, purpura, leukemia, cardiac affections, etc. Hemorrhage is either primary or secondary. In the former the patient is under the immediate control of the operator,

—who should not leave his patient—until the hemorrhage has been completely arrested. Secondary hemorrhage may occur at variable periods after the extraction, inasmuch as the loosening of the clot may arise from an almost infinite variety of causes, i.e. mastication, cough, sneezing, and passive vasodilatation following intense vaso-constriction after an injection of adrenalin. Some such hemorrhages have been known to occur fifteen hours after extraction and to recur several hours after they had been arrested.

The flow of blood from an alveolus is a capillary hemorrhage, and the best hemostatic treatment is the tamponing of the wound with cotton. As to medicinal agents, a great

many have been recommended. Adrenalin chlorid in solutions of 1:1000 is a very powerful hemostatic, but the intense vaso-constriction which it causes is followed by a passive vaso-dilatation. This after-effect is especially serious when it occurs as the result of having added the adrenalin to the cocain solution which was injected prior to performing the extractions. It happens under these circumstances that while the flow of blood is insignificant immediately after the operation, the secondary hemorrhages several hours afterward are, as a rule, very profuse. The local application of adrenalin, however, is not conducive to secondary hemorrhages when the agent is used to arrest a primary flow of blood. Intensely hot water is a good hemostatic, especially in the case of hemophiliacs, inasmuch as blood having an insufficient amount of fibrinogen coagulates at a temperature of 106° F. Iron perchlorid is an active coagulating agent in solutions of one to twenty per cent. Tampons saturated with the latter agent should be squeezed to remove any excess of the agent before applying it to the alveolus. Chloroform water in saturated solution (2:100) applied hot, serum-gelatin, hydrogen dioxid, antipyrin, etc., have all been used in the effort to arrest dental hemorrhages.

If the tamponing with cotton should prove inefficient, the addition of tincture of benzoin, sandarac, or collodion to the tampon will render the packing almost water-tight. In the case of hemophilia, seldom observed after the age of twenty-two, the administration of calcium chlorid—thirty to sixty grains per day—has given very satisfactory results.

[*Dental Brief*, Philadelphia, October 1907.]
SOME PRACTICAL POINTS IN ORTHODONTIA FOR THE GENERAL PRACTITIONER. BY RICHARD SUMMA, St. LOUIS, Mo.

Notwithstanding the generally accepted idea that orthodontia can only be practiced by specialists, the author states that any dentist who has the energy and desire to do this work can obtain proper results, provided he prepares himself by a thorough study of the subject. It is indisputable that every dentist should be able to diagnose malocclusion. By this Dr. Summa does not mean that he ought to be able merely to distinguish be-

tween a so-called crooked tooth and a straight one, but to diagnose the case in hand according to the principles enunciated by Angle. Another reason why dentists should be able to do orthodontic work is because many cities, although not large enough to support a specialist in orthodontia, have among their residents individuals suffering from irregularities which should be corrected.

The author contributes the following thoughts in concise form, which have been of value to him in his daily work:

"Occlusion is the basis of the science of orthodontia." (Angle.)

Every tooth in malposition is also in malocclusion.

Every malposition of the teeth of one arch has its compensating malposition in the teeth of the opposing arch.

The time is at hand when every dentist should be sufficiently familiar with occlusion—the working basis of orthodontia—to be able to recognize the initial stages of malocclusion, and to warn his patients accordingly.

Malocclusion of the deciduous teeth is far more prevalent than was formerly assumed. These cases can and should be treated early in life. According to recent experiences permanently beneficial results are readily obtainable. Examine the occlusion of every set of teeth, deciduous as well as permanent.

The first permanent molars are the key-teeth to occlusion because they are the first teeth of the permanent set to erupt; they erupt unhindered by any deciduous predecessors; they erupt on time; they are most certain to be present; they are the largest and most powerful teeth.

Always note the mesio-distal relation of the first molars.

Avoid extraction of the first permanent molar.

If the first permanent molar is irreparably injured, and extraction indicated, preserve the space it occupied and replace it at the earliest opportunity.

Avoid extraction. It is demanded but seldom.

Extraction for the purpose of regulation is incongruous.

Extraction has never corrected malocclusion, but often complicated it.

For study and reference obtain anatomically correct casts.

These are only obtainable from accurate plaster-of-Paris impressions.

To obtain such plaster impressions use good plaster, clean plaster bowls and spatulas; polished, smooth, and properly shaped impression trays.

To obtain casts from these impressions use thin shellac and sandarac varnishes, sharp and clean plaster knives.

Clean the teeth before taking impression.

The most frequent cause of gagging is the contact of the back of the tongue with the back part of the impression tray and plaster.

To overcome gagging instruct the patient to breathe deeply. This will involuntarily cause the tongue to drop.

In taking a lower impression instruct the patient to bring the tongue to the top of the tray to avoid drawing the plaster away from the lingual sides.

Employ fixed appliances, to the entire exclusion of removable ones.

Orthodontia appliances should combine simplicity, strength, efficiency, and inconspicuousness.

Orthodontia appliances consist of a device which engages the anchor or resistance teeth; a device or devices which engage the teeth to be moved; a device which conveys the force generated between these two points.

Orthodontia appliances are inanimate. They derive their life from the judgment of the orthodontist, which becomes material through the medium of his fingers.

Do not waste time and energy making orthodontia tools and appliances, which can be made, and made better, by the artisan.

At the same time acquire the necessary orthodontic technique.

Study the application of the expansion arch.

Employ the greatest care and foresight in placing these appliances so they need be changed least often.

The combination of forces which can be derived from the expansion arch are so numerous as to be practically infinite.

Take advantage of reciprocal force. It is most frequently and easily obtainable.

Take advantage of intermaxillary force.

It is not so much how great a force, but how constant a force is applied.

In applying an expansion arch do not bend

it to conform to the deformed arch, but bend it to conform as nearly as possible to the shape desired in the corrected arch.

Tolerate no loose ligatures. Always tighten ligatures before tightening nuts on the expansion arch—thus employ the spring of the arch before exerting pressure upon the anchor teeth.

Don't overtax the anchorage.

Cement all bands and keep the mouth clean as a prophylactic precaution.

Malocclusion of the teeth should be corrected in childhood.

Familiarity with the principles of occlusion is necessary to discriminate between the few cases which can be trusted to correct themselves with more or less assistance from pressure of the patient's finger, and the many cases which demand mechanical interference.

A patient is never too young for the correction of a malocclusion, but oftentimes too old.

Time and difficulty of tooth-movement and retention increase in direct proportion with the age of the patient.

To harmonize the occlusion, the teeth of both arches must be moved simultaneously.

Interdigitation of the cusps of the teeth is nature's retainer.

"The best balance, the best harmony, the best proportions of the mouth in its relation to the other features, require in all cases that there shall be the full complement of teeth, and that each tooth shall be made to occupy its normal position." (Angle.)

Orthodontic procedures conducted during the period of eruption and growth of the teeth may be considered as adjuncts to nature's efforts, and consequently favorable results are readily obtainable.

Whereas orthodontic procedures instituted when the teeth have assumed their final positions are to be considered as interferences with the result of nature's misdirected energy, consequently favorable results are fewer and more difficult to obtain.

Be on the alert for nasal obstructions in early childhood, and insist on their removal.

Lip habits seem to be potent factors in the causation of malocclusion. Early and late loss of deciduous teeth, while it is a factor in the causation of malocclusion, is not so potent as is often assumed. A study of the mechanism of development will dispel

the convenient story of the inheritance of the small jaws from one parent and the large teeth from the other.

[*Dental Review*, Chicago, October 1907.]

SOME OBSTACLES IN CROWN AND BRIDGE WORK. BY DR. N. S. JENKINS, DRESDEN, GERMANY.

Porcelain crown and bridge work has come to assume such great importance, and may now be accomplished to such great advantage, that it is well to review the fundamental basis upon which such work must rest, since if the foundation is firm there seems to be no limit to its usefulness. The treatment of roots is by far the most complicated factor.

The septic contents of the tubuli of a diseased root must be brought into an aseptic condition, but not that alone, as the root must also be so completely disinfected that when its apical foramen is closed and the crown or bridge set, infection cannot supervene. In such a case gutta-percha is not permissible. To remain in a healthy condition such a root must not only be hermetically sealed at the foramen, but it must also have its pivot so completely sealed that there can be no ingress of micro-organisms. A root-canal is often so attenuated toward the apex as to cause the pulp to tear at some slight distance below the foramen, and the remaining fine filament of pulp must still be completely removed, or serious consequences may supervene. The delicate film of living tissue, which often spreads to a microscopically fine web between the seemingly separated pulps in a bicuspid, nearly or quite to the apex, is a source of much trouble.

The buccal canal of an upper and the anterior one of a lower molar are not infrequently so obscure and so fine as to cause many an impatient operator erroneously to conclude that they have been obliterated by deposits of secondary dentin; and to attribute the continued tenderness of the root to some mysterious constitutional disturbance. But if the whole pulp to its finest remnants has been completely removed under proper antiseptic conditions, and the foramen securely closed, that tooth or root should be as completely comfortable as when it possessed a living pulp. But how is the pulp to be always completely removed? There are

cases which puzzle the very elect! For many years the author has had manufactured barbed broaches of unequalled fineness, which he has found of great value in removing attenuated filaments of pulp, but there are canals so fine that even those broaches cannot completely penetrate. For such cases the author recommends the sodium dioxide treatment, as advocated by Kirk, or the sodium potassium treatment as originated by Schreier, either of which accomplishes the important office of saponifying organic tissue.

The tooth under treatment should be dried as completely as practicable, and the agent carried gently into the canals. As soon as a little effect has been produced the resulting moisture should be removed, by absorbing it with some fine paper points and the use of hot air, and then the process of saponification should be resumed until every vestige of organic or putrescent tissue has been removed. This process enables the careful operator to obtain an aseptic condition otherwise, in many instances, impossible, and makes resort to mummification unnecessary. But when a root has been so far prepared to receive the post, additional difficulties are often encountered. Except with the X ray one cannot always tell with certainty the direction or the thickness of a root, and therefore the enlargement of the canal should be carefully proceeded with. Gently, and with a sensitive touch, the finest of the Beutelrock drills should first be employed, until the foramen has been reached or a sufficient depth obtained. A small flexible Donaldson broach should be frequently used to ascertain if the drill is keeping its proper direction, and if any deviation is perceived the drilling must be at once suspended, the canal carefully enlarged up to that point, and then it will usually be possible to determine the cause of the deviation. To perforate a root is a great and an inexcusable blunder. The Beutelrock drill is slightly weaker near the handpiece, so that if a special strain be exerted it will break at that point and not in the portion within the root. But after all this is completed, how shall the foramen be closed? The author gives his preference to zinc oxychlorid. It is not only antiseptic for a short but critical period, but clings so closely to place as to be mechanically resistant.

[*Le Progrès Dentaire*, Paris, September 1907.]
**MERCURIAL STOMATITIS: PRESENT
 STATUS OF THE QUESTION. BY DR.
 RAYMOND LULLE.**

From a clinical standpoint, and as suggested by Fournier, mercurial stomatitis may be classified as either *mild, ordinary, or intense*. The mild form is characterized by slight inflammatory symptoms in the gums and mucous membrane. The ordinary form manifests itself by dryness of the mouth, general irritability, fetidity of the breath, a feeling of "elongation" of the teeth, pain at the mandibular angle, and a metallic taste. The disease becomes localized mainly at the most remote areas of the gum—behind and around the third molar, in the interstice between the two central incisors on the labial side, and around any decayed tooth or root. As a general rule the gums are red and swollen and the teeth loose and covered by a layer of "sabulous" matter. Salivary secretion is very abundant, so much so that this phenomenon is the dominant symptom of the malady and is responsible for its being designated as mercurial salivation, mercurial sialorrhea, or mercurial ptyalism. Fetidity of the breath is invariably present; the parotid and submaxillary are occasionally hypertrophied and painful.

The pathogenesis of mercurial stomatitis has been of late the subject of considerable study and discussion. Mr. Alonkvist, having had the opportunity to examine three anatomical specimens of subjects who had died in the course of mercurial treatment, concludes that the deposition of mercurial granules takes place in the vessel walls, and in preference in the capillary loops nearest to the epithelium. During the evolution of the disease the following phenomena occur in the gum and mucous membrane: Deposition of granules of mercuric sulfid, vascular dilatation, diapedesis of leucocytes laden with the mercury granules, degeneration and death of the histological elements of the tissue. Mr. Alonkvist believes that mercury is deposited through the action of hydrogen sulfid formed during the decomposition of proteid matter in the mouth or intestinal tract. The latter compound precipitates the mercury which circulates through the bloodvessels and that which is eliminated through the oral mucous membrane, in the form of mercuric sulfid.

Hence the necessity of keeping the mouth and teeth in a perfect state of cleanliness during mercurial treatment, and of paying as much attention as possible to the digestive functions, in order to avoid the formation of excessive amounts of hydrogen sulfid. Inflamed gums caused by carious teeth do not hug the teeth tightly at the neck, and in the interstices thus produced food debris accumulates, and, undergoing decomposition, hydrogen sulfid is formed, which causes the precipitation of the mercury eliminated through the mucous membrane.

In animals mercurial intoxication is not as a rule accompanied by stomatitis, which, however, may be induced by detaching the gums around the teeth and irrigating the pockets for some time with solutions of hydrogen sulfid.

[*Bulletin du Syndicat des Chirurgiens Dentistes de France*, Paris, September 1907.]

**DISTURBANCES ACCOMPANYING THE
 DIFFICULT ERUPTION OF THE FIRST
 MOLAR. BY DR. JEHAN PRUDHOMME,
 PARIS.**

While the pathologic phenomena consequent upon abnormal eruption of the deciduous teeth, and of the third molar, have been carefully observed, and are to be found recorded in exhaustive contributions to the literature of the subject, as yet much remains to be written concerning such disturbances as may be induced by the delayed eruption of all the other permanent teeth, the first molar in particular.

The question of the occurrence of reflex disturbances at the period of eruption of the permanent teeth has been so satisfactorily elucidated by Dr. Eyssantier, as to leave no doubt whatever regarding its relative frequency. He found by studying the clinical histories of 20,000 children, that at least twenty per cent. of them had suffered from disturbances traceable to delayed tooth-eruption.

The disturbances caused by the evolution and eruption of the first molar may be divided into two groups, local and general. The local symptoms involve the mucous membrane almost exclusively, but in rare instances they have likewise induced pathologic reactions in the body of the jaw and its nerve supply.

The symptoms localized in the mucous

membrane, as in the case of difficult eruption of the third molar, occur more frequently in the mandible.

The child feels indisposed and experiences pruritus in the tissues overlying the erupting tooth. At first he feels slight pain of a dull and indefinite character, but later on it becomes more intense and is accompanied by a feeling of heaviness and burning. The more severe pain occurs at meals, during mastication, but occasionally it appears spontaneously while the child is playing, or during sleep. At this time the tongue is coated, the breath fetid, and the inflammation of the gum may spread to the cheek and tonsils. In a word, the child is suffering from stomatitis, which may assume the ulcerative or ulcero-membranous form if neglected when in the former stage.

The inflammation may also spread to the muscles of mastication—to the masseter in particular—and give rise to a degree of trismus which renders impossible the opening of the mouth more than a quarter of an inch. At the same time a slight swelling of the lower section of the cheek is noticed, and occasionally pain is experienced in the temporo-maxillary articulation.

If the foregoing chain of inflammatory phenomena should not be eradicated, the disturbance may spread to the maxillary periosteum, causing severe periostitis, which manifests itself by intense pain. In the most severe cases osteomyelitis and necrosis may ensue.

The nervous accidents are in the nature of dull, painful sensations, becoming paroxysmal at night and during mastication. There may also be acute pain radiating along the entire extent of the disturbed side of the jaw, to the ear, temple, and neck, upon the slightest pressure being made on the inflamed gum. In some instances the pain becomes neuralgic in character, and is localized in the areas of distribution of the trifacial; while in other rare cases the nervous disturbances are responsible for the onset of the phenomena of paralysis.

All local manifestations, strictly speaking, do not occur independently of systemic disturbances, in view of the fact that any process of infection in any area of the body must of necessity disturb the general nutritional balance—the regulator of all forms of physiologic activity. It is true that while not

infrequently the systemic derangements are at first so mild as to escape the eye of the attending practitioner, in some instances they assume a degree of severity such as to cause much anxiety to parents and physician. The general symptoms are at first those pathognomonic of infectious fever, namely, loss of appetite, feeling of malaise, pain in the lumbar region, occasionally chills, headache, and slight insomnia. At times, although the little patient is to all appearances in good health, he complains of an uneasy feeling in the head, and of pain in the jaw in the region of the erupting tooth.

In another type of cases the child presents a typical "grippy face," is pale and depressed, and suffers from a fever which oscillates considerably, and from pain in the region of the inferior maxillary nerve, which arises upon the slightest contact during mastication, deglutition, or digital examination. In the presence of these symptoms it becomes a very difficult matter to treat the mouth conditions, and thus relieve the intense inflammation. In addition, the inflammation may spread to the fauces and cause esophageal spasm and aphonia; to the ear, determining a painful otalgia; to the neighboring lymphatic ganglia, giving rise to submaxillary adenitis extremely difficult to diagnose; and possibly to the tongue, palate—soft and hard—and to the tonsils.

Concerning the diagnosis of pathologic eruption of the first molar, the author suggests digital examination, and inquiry of the parents regarding the time of appearance, frequency, and duration of the painful manifestations about the jaw, in order to determine the possibility of attributing such symptoms to an unerupted tooth; and finally, that the diagnostician bear in mind that difficult or pathologic eruption of the first molar occurs with greater frequency in the lower than in the upper jaw.

Treatment should be both medicinal and surgical—the medicinal, by the use of suitable antiseptic solutions in addition to thorough brushing of the teeth with a good dentifrice, in order to remove and destroy as many mouth-bacteria as possible; and the surgical, by cutting away the congested layer of gum tissue overlying the embedded tooth or by making a deep crucial incision in the gum. Should there be a collection of pus under the gum, the thermo- or electro-cautery

should be preferred to the lancet. Extraction of the tooth should be performed in the presence of an intense trismus which would prevent the child from taking the proper amount of nourishment; or of a severe adeno-phleg-

ACQUIRED ATROPHY OF THE MAXILLÆ. BY DR. J. M. HENRIGUEZ, BUENOS AIRES, ARGENTINA.

The author relates the case of a man twenty-nine years of age, in good health and of

FIG. 1.



FIG. 2.



mon of the submaxillary gland. After the surgical treatment due attention should be given to the inflammation of the mucous membrane, by keeping up the antiseptic treatment until complete recovery.

good personal and family medical history who about two years ago on a wager succeeded in crushing between his teeth a wooden cigar-holder. At the time he experienced nothing unusual, but about a month

afterward he noticed that one of his upper molars was very loose, almost on the point of being lost, and removed it. A few days later another tooth became loose, and as in the previous case was likewise removed by the

guez, who upon examining the case was at once struck by the deformity of the palatal vault caused by the absence of a large portion of the maxilla, the result of an atrophic process of traumatic nature. This atrophic pro-

FIG. 3.

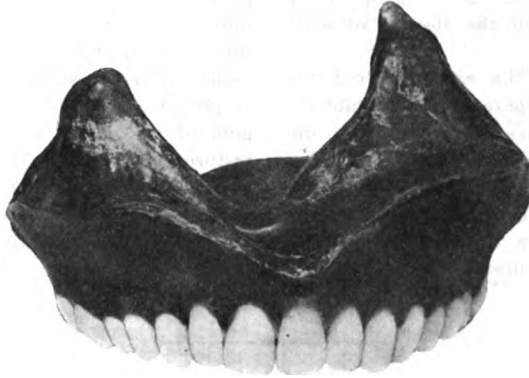
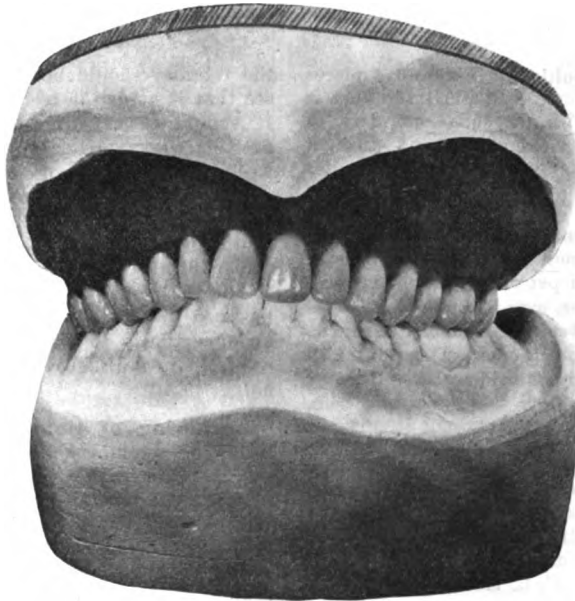


FIG. 4.



patient himself without the slightest trouble. Gradually every tooth was exfoliated, and in about two months' time his maxilla was edentulous. The foregoing is almost a verbatim report of the case as given by the patient at the time of visiting Dr. Henri-

cess, which had involved practically all of the substance of the maxilla, had produced two symmetrical concavities—one on each side of the jaw—so identical in shape as to lead one to the conclusion that they were congenital in origin rather than acquired.

Neither the tongue nor the salivary glands presented any abnormal features. The mandible was well developed and supported sixteen sound teeth. Owing to the palatal deformity, the articulation of words was rendered extremely difficult and unintelligible, so much so that the patient was often unable to make his wants known. The upper lip was sunken because of the absence of maxillary teeth.

The treatment of the case involved the construction of an apparatus that would obliterate the concavities—in which food unceasingly accumulated, and undergoing fermentation gave rise to disturbances which eventually might have assumed serious proportions—and afford a basis upon which to support the dental substitutes. After con-

siderable difficulty an accurate plaster-of-Paris impression was obtained (see Fig. 1), and from it the plaster cast shown at Fig. 2. The apparatus devised and constructed by the author is shown at Fig. 3, while at Fig. 4 the restored articulation is illustrated. The apparatus is provided with two hollow projections of vulcanite, which fit accurately into the palatal fossæ, thus preventing the collection of food debris and mucus, and assisting in the support of the piece, which is provided with fourteen teeth and with a gum of the degree of thickness required to restore the normal contour of the upper lip. The piece weighs about two ounces, and enables the patient to articulate easily and intelligibly, and in addition has greatly improved his facial appearance.

PERISCOPE.

Flux for Soft Soldering.—Dissolve pieces of zinc in hydrochloric acid until the acid is saturated. Mix with an equal quantity of equal parts of aqua ammonia and alcohol. Filter after a few days' standing.—*Dental Era*.

Tightening Screw Connections.—For tightening screw connections, dissolve powdered shellac in ten per cent. ammonia water and paint the mass over the screw threads after they have been thoroughly cleaned; then screw the fitting home. The joint will be impervious to hot or cold water.—*Popular Magazine*.

Annealing Platinum.—We find that many will bring platinum to a pretty good red heat and believe it is annealed; but practically nothing is accomplished in the way of annealing until platinum is heated to a white incandescence, and until then you have softened it very little.—C. L. HUNGERFORD, *Western Dental Journal*.

Care of Retaining Appliances.—Retaining appliances must first of all be made strong, and next must be cemented in place exactly where wanted. If the least imperfection of setting occurs, the retainer should be at once removed and set again, until every detail is correct. After cementing in place,

the retainer should be carefully examined to see that it holds the teeth exactly as planned. It should be examined every week for the first six weeks; after that every two or three weeks during three or four months. About every three or four months the retainer should be worked loose, the teeth given a thorough cleaning and polishing, and the retainer firmly cemented back in place. This should be done whether the appliance has loosened or not, so that decay may not have an opportunity to start under bands or elsewhere.—W. J. BRADY, *Western Dental Journal*.

Anchoring of Gold Inlays in Occlusal Surface.—I am not sure that I have a lasting operation with a gold inlay unless I have it well anchored in an occlusal dovetailed slot; and if the occlusal surface is not involved and crushing force does not have to be considered, then, from the standpoint of beauty, a porcelain inlay is to be preferred. In cavities of ordinary size, except in the anterior teeth, I prefer the gold filling that has served us so well for a long period of years, reserving for gold inlays those large cavities with frail walls, not only to avoid the strain on the nervous system of operator and patient, but also for the reason that the inlay will not spread as a large gold filling

will, thereby fracturing the wall of the tooth. In such cases the use of a gold inlay will give efficient service. This inlay must be embedded in a good body of cement, and whenever it is possible, the use of the rubber dam, to insure cleanliness and freedom from moisture, enhances the value of the operation.—JOHN A. SCHMIDT, *Items of Interest*.

Extraction of Abscessed Tooth.—There is no more reason why an abscessed tooth should be retained in the jaw simply because the face is swollen than there would be for allowing a splinter of wood to remain in the hand, a piece of glass in the foot, or a piece of steel in the eye, until the inflammatory symptoms had subsided, before attempting to remove them, since the forms of pathology are identical.—*Items of Interest*.

To Perfume Vaseline.—Much of the vaselin sold today has an unpleasant odor, and this is especially noticeable when it is used for lubricating disks and strips in finishing fillings. The odor may be overcome by adding to the vaselin a few drops of one of the essential oils—whichever the operator may prefer. This does not in any way impair the vaselin and makes it more agreeable to use.—C. N. J., *Dental Review*.

To Re-bake an Inlay.—If for any reason you desire to re-bake a porcelain inlay after you have removed the platinum matrix, make an investment of powdered soapstone and thin shellac varnish, and while the investment is fresh embed the inlay, cavity side down, until flush with the margins. Dry slowly, and you may then re-fuse it as high as you like without changing the margins or shape of the inlay. This would probably not do for low-fusing porcelain, because the shellac would not all burn out and a discoloration would develop. The soapstone powder may be made by scraping a fresh mechanic's crayon.—J. M. EVER, *Tri-State Dental Record*.

The Sequel of Inlays.—The use of cement under gutta-percha has given me greater satisfaction than any other application of this method of filling. To fill a tooth with gutta-percha is usually regarded as a very simple operation, but if a really good filling is to be made the material must be placed with much care. The tenderness which occurs under gutta-percha fillings tells us they are far from moisture-proof. Soft cement placed in the cavity and the gutta-percha forced into it will give a filling that absolutely stops the cavity—it will have the non-conducting qual-

ity of the gutta-percha and the cavity-sealing quality of the cement. Personally I have found the mounting of crowns with gutta-percha very difficult, and recently have been using a combination of gutta-percha and cement for many cases. The gutta-percha is placed upon or in the crown, as the case may be, and while soft the latter is pressed to place. After removal of crown and gutta-percha the root is smeared with the soft cement and the crown replaced, allowing the former to cover the root and cement the gutta-percha to it. In the use of Ascher's cement it is very desirable to line the cavity with a good inlay cement. The adhesive qualities of the latter seem to keep the Ascher's cement in its place, and to make a better adaptation to the cavity walls.—E. A. ROYCE, *Dental Era*.

A Word of Warning in Desensitizing Dentin.—To those who are in the habit of obtunding sensitive dentin by pressure anesthesia I wish to give a word of warning. This is a dangerous procedure, not only because cocain is a protoplasmic poison, but also because, as the cavity has not been excavated, the agent is forced through infected tissue, and made to carry the products of that infection into the pulp—a condition which cannot, by any line of reasoning that I can figure out, be anything but deleterious to the pulp tissue. It is undoubtedly true that many pulps die, even years afterward, as the result of the injudicious use of pressure anesthesia.—E. MAWHINNEY, *The Bur*.

Carbolic Acid Antidote.—In a communication to the *Lancet* Mr. John Maberly draws attention to the efficacy of iodine as an antidote in carbolic poisoning. The first hint as to the antidotal value of iodine was conveyed by the practice of a Middlesex Hospital surgeon of rinsing his hands—numbed with carbolic solution—with iodine water. The effect was almost immediate, the iodine removing the numbed feeling as well as the bleached, crinkled condition of the skin. Since then Mr. Maberly has tried its effect internally in one case where carbolic acid was taken, and in two other cases where Jeyes' fluid (a disinfectant) had been accidentally swallowed. The effect in all cases has been excellent and prompt. In the carbolic acid case referred to, the patient had drunk some carbolic acid in mistake for whisky, and at the time of the doctor's visit could scarcely speak, and was unable to swallow, the lips, tongue, and fauces being whitened from the effects of the acid. A teaspoonful of tincture of iodine was mixed with a cup of water and the patient

directed to drink the mixture slowly. A few minutes later the man was so much relieved that he was able to drink milk, and his voice and breathing improved. A little more iodine solution was administered during the night, and the next day the patient was sufficiently comfortable to be able to undertake a journey. The cases where Jeyes' fluid had been taken were those of children, and small doses of diluted iodine worked wonders. Discussing the chemical reaction, Mr. Maberly notes that one minim of liquid carbolic acid (B. P.) neutralizes about one minim of tincture of iodine, but that with heat more iodine can be decolorized. It is therefore recommended for practical purposes that equal parts of tincture of iodine and phenol be looked upon as complementary.—*Chemist and Druggist*.

Treatment of the Gum with Chloro-percha Before Setting a Crown.—When the gum has been wounded in grinding the root or in reducing the band to the root-level, the acid of the cement works into the wound and gives rise to discomfort similar to that following the application of salt or vinegar. This of course subsides as the cement sets, but is anything but pleasant while it lasts. To overcome the pain thus inadvertently induced, and to prevent such as may attend the setting of the crown, I dry the root and adjoining gum and paint them with chloro-percha. The effect is immediate, and the discomfort hardly worthy of mention.—I. C. EDINGTON, *Dental Office and Laboratory*.

Suggestions Concerning the Preservation of Children's Teeth.—All children attending the school dental clinic at Strasburg for treatment now receive a pamphlet containing the following advice: "At the age of two and one-half years every child has twenty teeth. The first permanent molar appears at the back of the mouth in the sixth year. Permanent teeth replace the milk teeth between the years of seven and fourteen. The second molars appear in the twelfth year, and the third molars, or wisdom teeth, after the eighteenth birthday. Sound teeth are necessary for the health of the stomach and of the whole body. The milk teeth are of more importance to the child than the permanent teeth are to the adult. Sound milk teeth are a condition of sound permanent teeth. The teeth must be brushed every morning, and especially every night, with a brush of medium hardness. A salt-water solution should be used, and every second day a preparation of chalk. Twice a day the tonsils should be cleaned by gargling. Every

half-year, from the age of three upward, the mouth should be examined by the dentist. As soon as the teeth, and especially the milk teeth, begin to decay, they must be filled or toothache will result. The mouth must be kept continually clean; all roots which have been filled must be extracted, and all tartar must be removed. Artificial teeth are but a poor substitute for natural teeth. Good mastication means easy digestion."—*Dental Record*.

A Convenience.—Take a newspaper, cut into strips some one inch wide and others one and one-half inches, full length, and lay one upon another in a pile. Drive a tack in one end of the strips and tack them up in the laboratory. When ready to run a cast, tear off a strip, dip it in a bowl of water, wrap it around the impression, and the paper, being wet, will adhere to itself upon its being wound. Now fill the impression with plaster to the top of the paper rim. When full, invert the impression and set it on a glass slab to "set." When set, dip it in water to wet the paper and then unwind it, and trim the cast to the required shape.—H. H. SULLIVAN, *Western Dental Journal*.

Evil Results of the Air-Chamber.—My observation since I have been practicing dentistry leads me to believe that more irritated throats have been caused by the air-chamber in those who wear artificial dentures than by all other causes combined. There may be a case occasionally in which the air-chamber will be of some advantage, but I have my doubts as to whether it can be of any benefit at all. Most air-chambers are made too deep; they cause the soft tissue to sink into the cup and consequently irritate and inflame the whole roof of the mouth, sometimes causing severe pain. I am a staunch believer in omitting the air-chamber in all artificial dentures. I firmly believe that if a close-fitting impression in plaster of Paris is taken of the mouth there will be no need of an air-chamber. Good adaptation is what we want, and not a vacuum to suck the life out of the soft tissues of the roof of the mouth, and thereby cause inflammatory conditions.

If we examine the roof of the mouth of one who wears an artificial denture with an air-chamber in it, and compare it with another in which the air-chamber is omitted, we note at once the vast difference in appearance. There is always more or less inflammation in the roof of the mouth when the air-chamber is present, and on the other hand, we will note a nice, smooth appearance of the roof,

free from all irritation, when the plate is without it. When I first commenced practicing, I always made upper dentures with air-chambers. Finally I saw some dentures, made by other dentists, which had none, and the patients who wore them had no inflamed mouths. So I thought I would try my next case without the air-chamber; the results were so satisfactory that I have long ago discarded the old method. I am sure they are a detriment to the soft tissues in the roof of the mouth. I do not have any trouble in making my dentures adhere when I get an accurate impression.—L. S. JOHNSTON, *Dental Era*.

Prosthetic Suggestions.—In the preparation of casts for the vulcanizing process, we often make the mistake of saturating them with water after we have secured the cast, or in boiling out the wax. We ought never to do this; a plaster cast that is very hard and dense, if simply dropped into water for thirty seconds and taken out, can be whitened quite easily. If you have a very thin cast, it will soak up enough water in a short time to so destroy its integrity that it will break under the pressure put upon it in closing the flask.

In the matter of flasking these pieces, I have not yet found a flask that is at all to my notion—none of them are deep enough. You cannot put into any of the brass flasks on the market an ordinary cast, with the teeth on it, and have more than perhaps half an inch of plaster over the palate, where the great amount of pressure is usually brought to bear. Sometimes casts are cut down at this point to possibly one-eighth of an inch, so that if they be held up to the light, one can almost see through them. You cannot expect a cast of that kind to stand the enormous pressure of two tons—which Dr. Prothero says is frequently put upon it—without its fracturing. The support that you get from the investing plaster is not sufficient to support such a thin cast. If it could be made thick enough, it would well withstand the pressure without giving way.

The flasks should be about three-fourths of an inch deeper than they are. In connection with packing the flask another thing might be mentioned. Dentists usually close them in boiling water, and put in so much rubber that they cannot possibly get the flask together, and then boil for ten or twenty minutes to get the vulcanite to flow away in order to effect the closing. This boiling of the plaster must destroy its integrity.—N. S. HOFF, *Dental Register*.

Common-Sense Treatment of Pyorrhea.

—Having removed the deposits as thoroughly as possible, any of the accepted medicinal treatments may be used. The writer is strongly of the opinion that much more depends on instrumentation than on medication. The following has given excellent results:

No. 1.

R—Iodin crystals,	gr. x
Creasote,	$\frac{3}{4}$ ss.

No. 2.

R—Tannic acid,	gr. x
Glycerin,	$\frac{3}{4}$ ss.

To use the above, pump the pocket full of No. 1, using a wooden toothpick or sharpened orange-wood stick. Wait thirty seconds, and follow with No. 2, used in the same way. Having treated each of the affected teeth in this manner, prescribe a good mouth-wash and dismiss the patient for four days. If at the end of that time there is any pus-formation noticeable, the entire treatment—scraping, polishing, and medication—is to be repeated.

This line of treatment will effect a cure in a comparatively short time, provided all the calcic deposits are removed.—F. G. WORTHLEY, *Dental Summary*.

Diatric Teeth in Bridge Work.—Diatric bicuspid and molars can be advantageously used in bridge work, getting rid of the unsightliness of gold cusps, leaving the tooth all its strength, and in case of a breakage, which is very unlikely, it can be repaired in the mouth. The technique which I have adopted is about as follows: After a tooth of the required size and proper shade has been selected, grind the under lingual side, that there may be no pocket under the gold for lodgment of food, and in order to give the desired angle. Fill the hole in the diatric with modeling compound or plaster, dressing down to a smooth surface with the tooth; press the ground side of the tooth in moldine that it may leave an impression of the ground side, extending up about the thirty-second of an inch on all sides except the lingual, allowing the moldine to come up nearly to the cusp on that side. Make a die of Melotte's metal from this impression and strike up a gold plate. Trim the gold to lap snugly over the buccal edge and well up on the approximal and lingual sides. After this is satisfactorily trimmed and burnished to the tooth, with the plate punch make a hole over the center of the opening in the diatric tooth; clean out the plaster or modeling compound and fit a wire of iridio-platinum in this hole in

the tooth. Place the gold plate back on the tooth and thrust the wire through the gold and up in the tooth. Secure by waxing pin to gold, chill the wax and remove, being careful not to disturb the wire in its relation to the gold plate; invest and solder the wire to the gold on the waxed side; the wire may now be cut off and dressed down level with the tooth. Place in position on the articulator, and when satisfactorily adjusted and waxed to place the diatoric tooth may be removed, and the case invested and soldered, building in solder sufficient to leave a firm and unyielding seat for the tooth. After the case is finished the tooth is cemented to place and the gold burnished around the edges.

By this method the unsightliness of gold cusps is eliminated, and the cement protected by the nice fitting of the gold, which assures its lasting; and in case of a possible accident, such as the fracturing of the tooth in the mouth, by keeping a record of the number of the mold, make of tooth and shade, another can be substituted which will fit as accurately as the first, and without removing the bridge from the mouth.—D. T. HILL, *Dental Brief*.

Anchorage Pins for Large Porcelain Restorations.—Usually, when a large restoration is to be made in a pulpless anterior tooth, previous separation is not absolutely necessary, as there is access to all parts of the cavity by reason of so much loss of tooth-substance. After the matrix is properly fitted, a small iridio-platinum post is carried through the bottom of the matrix well up into the canal, leaving just enough of the head-end projecting to permit of its secure attachment to the porcelain. A cone of slightly warmed stiff wax or modeling composition, after being pressed into the cavity, completely covering the matrix and post, is cooled with ice-water. Remove the wax, to which the matrix and post should be attached. Invest in plaster and pumice; after the investment hardens boil out the wax and the piece will be ready for the first baking. Mix the porcelain powder and fill the matrix to one-third full, place it in the furnace, and bake it. Large pieces such as I have described usually require several bakings. When the porcelain reaches the margins remove it from the investment, and return it to the cavity for a second burnishing. While the matrix is in the cavity, form in your mind an image of the shape and contour to be given to the inlay. After the inlay is baked to the proper shape and contour the matrix is stripped off, and the inlay is cemented to place.

An incisor broken on the cutting-edge—

to, say, one-fourth or one-third the length of the crown—when the pulp is not exposed, can be restored with porcelain by the following method: Smooth the broken surface and cut a flat groove, not deep, in the incisal portion of the tooth; drill two holes, one on each side, remote from the pulp, to the depth of about one-eighth of an inch, of just sufficient size to accommodate platinum pins taken from an old vulcanite tooth. Try the pins in the holes to see that they will pass in and out without hanging. Burnish the matrix to the surface and well into the groove. Puncture holes through the matrix, and leave a sufficient portion of head-end projecting to securely attach to the porcelain; take an impression and proceed in the same manner as in the other case described previously.—L. P. ROBERTSON, *Texas Dental Journal*.

Thymol-Camphor.—Risacher (*Journal de Médecine de Paris*, August 18, 1907) describes thymol-camphor as a liquid, which is greasy to the touch, and has a density of 0.957. It is insoluble in water, but is soluble in the oils, in alcohol, in ether, and in chloroform. If left exposed to the air it turns a light yellow, but is not decomposed, like naphthol-camphor. It is prepared by direct combination in the following proportions: Camphor, 300 gm.; thymol, 160 gm. By placing this mixture in a flask and agitating it from time to time, a liquid is obtained. The solution is more rapid and clear if the flask is gently warmed. It should be filtered and the liquid kept in bottles of yellow glass. One cubic centimeter will contain of camphor 0.638 gm. and of thymol 0.319 gm. It is possible also to make a liquid by combining these substances in different proportions—as for instance, thymol 100 gm. and camphor 40 gm.—so as to form a clear solution, especially with the aid of heat. It is employed especially to reduce fungosities of a tuberculous character. Thus, in a cold abscess, or one connected with caries of bone, softening of a gumma, or degeneration of a gland, the interior may be filled by large granulations, too large to escape through the trocar. Thymol-camphor injected in such a collection produces better results than any other agent. It has two special actions: (1) An immediate action, permitting the rapid evacuation of a fungous abscess—or at least it relieves its tension and avoids formation of a fistulous tract; (2) a mediate action, which it exercises upon the contents of the abscess at the end of a few days—three to six days generally, aspiration at this time bringing away a viscid, chocolate-colored fluid, of distinct camphoraceous odor. This transforma-

tion of the fungosities into a pasty liquid also takes place *in vitro*, when we note that the fungosities swell up, the fats become emulsified, and finally, all form a viscid liquid, which does not adhere to the wall of the tube. It has been noticed that the injection of thymol-camphor is not followed by a fistula; the tract closes up in a few days and leaves no induration. After aspirating an abscess, the needle is left in position; and from two to four cubic centimeters of thymol-camphor are injected into the interior of the sac, part of which is allowed to escape. A second aspiration may be practiced in a few days. It is advised that a syringe of glass, of the Luer type, should be used for the injections. In withdrawing the needle it should be stopped by the thumb, so that the last drops of the pus may be drawn into the track of the needle. Finally, the little wound is sealed with gauze and collodion. In the case of a tuberculous lymph gland, a few drops of the solution are to be injected into the interior. After two or three injections, the gland becomes soft and ductuates, and can then be treated like the preceding.

In this way it is possible to remove strumous glands without producing a cicatrix, which the patient so much dreads, and which may become affected with keloid. No unpleasant symptoms follow these injections, unless the liquid should be accidentally thrown into a vein. Nervous symptoms may follow, but the observer states that he has used this combination for nine years, and has made more than one thousand five hundred injections without seeing a single case of intoxication produced by them. From experiments made in animals, its toxicity is estimated at one-half that of naphthol-camphor (beta naphthol, 100; camphor, 300 parts).—*Therapeutical Notes*.

Electric Sleep.—Professor Leduc of Nantes has published the remarkable results he has obtained by means of his electric sleep. He gives this name to a condition comparable to chloroform narcosis, in which the subject lies without any powers of sensation or of voluntary motion, only certain reflex movements and the action of the heart and of the respiratory functions persisting. This condition is produced by the action on the brain of a certain form of electric current, and may be maintained for hours, and brought to an end instantly with the interruption of the current. The current used to produce the electric sleep is intermittent, of low tension, and constant in direction; that is to say, it flows for a certain period, stops, and then flows again at perfectly regular intervals. It is generated by means of a source

of continuous current and of a specially constructed form of interrupter. On applying it to the head, sensations of taste and of light are produced, and vertigo, depending to some extent on the manner in which the electrodes are applied, is caused. In order to inhibit motility and sensation the current should attain a voltage of about six volts, but if increased to ten volts respiration and heart action cease and death follows. Leduc has subjected himself to this action and has reported in a very interesting manner the sensations produced during a period of narcosis lasting twenty minutes. A remarkable fact is that when the flow of current is interrupted the subject awakes immediately, without any of the after-effects that follow chloroform narcosis.—*Medical Record*.

Cavity Preparation and Formation of Matrices for Porcelain Inlays.—I might say at this time that I do not rely wholly upon the cement to retain inlays. It is seldom that I fail to groove an inlay, and I give it every possible advantage that I can. After the inlay is constructed, the cavity should have a shallow groove running along the labial and lingual walls, and the inlay should be correspondingly grooved so that it will form a mortise in the cement—and I have found that since I have been grooving my inlays and grooving the cavities I am having fewer inlays to reseat than I formerly did.

There are several materials used for forming matrices. We know that we have pure gold, platinum, and platinum. Those who use the low-fusing porcelains claim that the pure gold is better because it is easier to force into the cavity. While there are a few cases where pure gold may be used in constructing matrices and be withdrawn from the cavities successfully, I believe as a general proposition, if cavities are prepared on proper mechanical principles, that platinum is by far the best material for the construction of matrices. My principal objection to pure gold is that in case it is necessary to tease the matrix from the cavity—many times it requires quite a bit of teasing—there is a tendency, because of the pliability of the material, to change form, while platinum, because of the elasticity of the material, can be teased from a cavity and will retain its original form. The advocates of the gold matrix say that if the matrix is invested there is no danger of warping. I find that there is but little danger of warping if platinum matrices are properly handled. I have also found that the time consumed in investing matrices and cooling them down after each baking—presuming I am employ-

ing the low-fusing porcelains—is greater *in toto* than the additional time required to construct a matrix of platinum. Therefore in those cases where I feel that there is danger of a gold matrix springing if I do not invest it, I use platinum for constructing the matrix.—JOHN Q. BYRAM, *Tri-State Dental Record*.

Radium Emanation and Transmutation of Elements.—The *Lancet* says that Sir William Ramsay has promised to communicate to the Chemical Society shortly a full account of his researches on the radium emanation. The occasion will mark a great epoch in the history of chemical science, since his investigations have shown that a given element under the powerful action of the radium emanation undergoes “degradation” into another. In short, the transmutation of elements is actually *un fait accompli*. We already know that helium appears as the radium emanation disappears, while when the emanation is in contact with and dissolved in water, neon is produced; but when in contact with a solution of copper salts the chief product is argon. More marvelous still is the fact that when copper salts are used lithium appears where before was no

lithium. Copper is thus “degraded” to the first member of its family—i.e. lithium. For aught we know to the contrary, the time may ultimately come—after, of course, ages and ages—when the metallurgy of the world will be “degraded” to the alkaline metals. It would appear, therefore, that the noble metals are slowly breaking down, and that gold, platinum, uranium, and other elements of high atomic weight will disappear, and that their descendants will be the commonplace elements. This would seem to teach that gold and the other metals exhibiting high atomic weights have, after all, a complex and unstable constitution, the tendency of which is to resolve into simpler substances.

These remarkable discoveries remind us again of the extraordinary prescience of the ancients, of the presentiments of the alchemists, who evidently had some sort of a conviction that, after all, there is a primary matter from which all other elements are formed by various condensations. He is a bold man who nowadays confesses skepticism about anything. The world has seen men who have said “It is impossible!” Generations have succeeded them who have seen the “impossible” come to pass.—*Dental Record*.

HINTS, QUERIES, AND COMMENTS.

GUTHYMOL.

THYMOL added to gutta-percha makes a very useful preparation for dental purposes. It possesses very desirable working properties, setting slowly and becoming hard. I have used it successfully as a temporary stopping and filling material for children's teeth; also as an insulating material and to crowd away overhanging gum margins and to obtain impressions of cavities.

To obtain a satisfactory grade of guthymol add to base-plate gutta-percha a five per cent. solution of thymol and soften the gutta-percha under heat. A mixture of guthymol, oil of cajuput, and a few fibers of asbestos makes an excellent root-canal filling.

When ready to fill a cavity add to the re-

quired amount of guthymol a few crystals of thymol and spatulate the mass thoroughly, when it will acquire a degree of pliability which renders its insertion in a tooth-cavity an operation of the simplest character.

CARLOS ZACHARIAS.

S. Paulo, Brazil.

DEVITALIZING PASTE.

IN a communication to the Editor, Dr. GEORGE G. WEINSTEIN recommends as a devitalizing mixture a paste made by adding lysol to the proper amount of arsenous oxid. and cementing the paste in the cavity of the tooth.

OBITUARY.

DR. SULLIVAN LAWRENCE WARD.

DIED, in Lowell, Mass., July 11, 1907, after a long illness, in his eighty-first year, Dr. SULLIVAN LAWRENCE WARD.

Dr. Ward was born in Thornton, N. H., July 4, 1827. His father, Dr. George Ward, a practitioner of dentistry, moved to Lowell in 1837. His son, the subject of this sketch, attended school at Plymouth, N. H., until 1846, when he took up the study of dentistry in his father's office. In 1847 he opened his own office, which he occupied up to the time when he was stricken with paralysis—about three years ago.

During the whole of his long professional and public career Dr. Ward was one of the most active citizens of his city, not only enjoying a large practice, but taking a prominent part in the municipal and civic life of his community. He became a member of the Lowell Common Council in 1860, remaining in that office for one year. In 1864-65 he was a member of the Legislature, and during his incumbency was active in the promotion of all enactments of benefit to his constituency. He was one of the founders of the Merrimac Valley Dental Society, which was eventually merged in the Northeastern Dental Association.

Dr. Ward was a member of the King Street Congregational Church, which he joined in 1848, and in the work of which body he always took an active and interested part. In 1870 he was elected president of the Lowell Y. M. C. A.

Dr. Ward was married August 12, 1852, to Miss Mary F. Morgan, of which union two children, a son and a daughter, were born.

His life was exemplary; he was active in good deeds, kind, generous, and charitable, and his death removes a valuable citizen and a kind father, whose loss will be widely and deeply mourned.

DR. HORACE PARKER.

DIED, at his home in Edgefield, S. C., July 11, 1907, in his eighty-sixth year, Dr. HORACE PARKER.

Dr. Parker, one of the best-known practitioners of dentistry and most highly respected citizens in his locality, was born February 28, 1822, at Ackworth, N. H., where he obtained his early education. Having studied dentistry in Philadelphia—doubtless under private preceptorship, as no dental college was in existence in Philadelphia previous to 1852—he went South at the age of twenty-two to visit an elder sister, located in Edgefield, S. C. Attracted by the climatic conditions and natural beauty of the country, he decided to remain there permanently. He at once began the practice of his profession, which he successfully continued through a period of sixty-two years. Dr. Parker was a skilled practitioner, being specially noted for the high excellence of his prosthetic work. He was among the first in the South to practically introduce Allen's continuous gum work, and certainly the first in his locality to use that method.

Soon after his arrival in Edgefield, Dr. Parker married Miss Sarah Catherine Dorn, by whom he had twelve children.

His life was essentially a quiet, unobtrusive one. Coming of a New England family noted for its literary tastes and attainments, his pursuits were of the simple, quiet order that was most in harmony with his inherited characteristics. By his many lovable traits of character, by his steadfast loyalty to the interests of those about him, by his devotion to duty and his ever-ready spirit of helpfulness, he gained the love and respect of every member of the community in which he lived, and which he had faithfully served through a long and devoted professional and public career. His loss will be keenly felt by his host of friends and admirers, as well as

by those to whom he was related by family ties.

He was buried, with Masonic honors, on Friday, July 12, 1907.

of Summit, N. J. He also leaves a brother, Dr. Charles Lee Strickland of Charlottetown, P. E. I.
H. A. K.

DR. ISAAC STRICKLAND.

DIED, at his home in Bangor, Me., Tuesday, March 19, 1907, Dr. ISAAC STRICKLAND, in the seventy-seventh year of his age.

Dr. Strickland was born in Turner, Me., and was the son of Col. Lee and Mary (Hanson) Strickland. He was educated in the public schools of Livermore, the Bangor high school, and the Maine Wesleyan Seminary at Kent's Hill. In May 1848 he took up the study of dentistry in Boston, and in 1853 established himself in Bangor, where he continued in successful practice until 1901, when failing eyesight compelled him to retire.

Dr. Strickland entered the practice of dentistry when ability was an absolute requirement, and easily stood in the front rank of his profession. It is the opinion of the writer that the world has never known a more skillful manipulator of non-cohesive gold, and by this method, destined to become obsolete, he imparted a character to his work which after many years of service reflected the sterling integrity of the quiet, just, and unassuming man. He was a member of the Maine Dental Society.

At the outbreak of the Civil War, Dr. Strickland entered the volunteer service as quartermaster of the Sixth Maine Regiment, but a severe and long-continued attack of malaria obliged him to resign.

He served in both branches of the city government of Bangor, was chairman of the school committee, and for some years was a director of the Bangor and Piscataquis railroad. He was a member of the Loyal Legion, a director of the Tarratine Club, and a Knight Templar.

In 1859 Dr. Strickland married Frances A. Wing, who survived him but a few days. They had one daughter, Mrs. J. E. Tucker

RESOLUTIONS OF REGRET.

Dr. John I. Hart—Dr. J. Bond Littig—
Dr. Richard C. Brewster.

At a joint meeting of the Interstate Dental Fraternities of New York and New Jersey, held in New York, July 12, 1907, the following preamble and resolutions were passed:

Whereas, It has pleased our Heavenly Father to call our friends, co-workers, and founders of this fraternity, Dr. John I. Hart, Dr. J. Bond Littig, and Dr. Richard C. Brewster, from their earthly labors, which they so faithfully and conscientiously performed, to their eternal reward; and

Whereas, They who were so faithful in friendship, generous in deeds, equitable and just to all men, kind and sympathetic in their natures, were wise counselors, whose high sense of honor and consistency at all times characterized their professional and private lives; therefore be it

RESOLVED, That we, the members of the Interstate Dental Fraternities of New York and New Jersey, in session assembled, do record our deep sense of the loss which the dental profession and this fraternity in particular have sustained; and be it further

RESOLVED, That we extend our heartfelt sympathy and sorrow to the bereaved families, and that these resolutions be spread upon our minutes and published in the dental journals, and that copies be sent to the bereaved families.

F. C. WALKER,
Vice-pres. for New York,
T. A. QUINLAN,
Sec'y for New York,
S. C. G. WATKINS,
Vice-pres. for New Jersey,
F. G. GREGORY,
Sec'y for New Jersey.

SOCIETY NOTES AND ANNOUNCEMENTS.

INTERNATIONAL ASSOCIATION OF STOMATOLOGY.

INAUGURAL MEETING HELD IN PARIS.

THE organization of the International Association of Stomatology, which has just taken place in Paris, August 6 and 7, at the time of the First French Congress of Stomatology, was very successfully consummated. The proceedings of this important session will be published later. We can only give, at this time, the list of officers and the consulting committee, composed of a member from each represented country, elected for two and three years.

OFFICERS.

Honorary Presidents—Dr. Eugene S. Talbot, Chicago; Dr. L. Cruet, Paris.

President—Prof. Jos. von Arkövy, Budapest.

Vice-presidents—Prof. C. Redard, Geneva; Prof. C. Platechick, Milan; Dr. Otto Zsigmondy, Vienna; Dr. Johan Rygge, Christiania.

Secretary-general—Dr. H. Allaëys, Anvers.

Secretaries—Dr. J. Sim Wallace, London; Dr. J. Breithach, Dresden; Dr. D. Nicolescu, Bucharest.

Treasurer—Dr. F. A. Meyer, Amsterdam.

CONSULTING COMMITTEE.

Germany. Dr. Müller, Mittweida, Dresden,
England. Dr. Anderson, Glasgow.

Austria. Dr. J. Wachsmann, Prague.

Belgium. Dr. Oswald Rubbrecht, Bruges.

Denmark. Dr. Marinus Holst, Copenhagen.

Spain. Dr. José Boniquet, Barcelona.

United States. Dr. G. V. I. Brown, Milwaukee, Wisconsin.

France. Dr. P. Gires, Paris.

Finland. Prof. M. Ayrappaa, Helsingfors.

Greece. Dr. Panos Panourias, Athens.

Holland. Dr. Hugo Rethy, The Hague.

Hungary. Dr. Gadany, Budapest.

Italy. Dr. Camillo Rovida, Milan.

Norway. Dr. J. Brun, Christiania.

Portugal. Dr. Manuel Caroca, Lisbon.

Roumania. Dr. Paul Marcovici, Bucharest.

Russia. Dr. Max Eliasstamm, Kieff.

Servia. Dr. Milos C. Popovic, Belgrade.

Sweden. Prof. Otto Ulmgren, Stockholm.

Switzerland. Dr. Berg, Chaux-de-Fonds.

The next meeting of the International Association of Stomatology will take place at Budapest, August 1909, at the time of the Sixteenth International Medical Congress, which congress will have a Section on Stomatology open to all medical graduates.

E. S. TALBOT, *Hon. Pres.*

NOTICE FROM N. D. A. COMMITTEE ON THE HISTORY OF DENTISTRY.

Soon after the Buffalo meeting of the National Dental Association in 1905, this committee announced, through the dental journals and otherwise, the exceptional opportunity which had made it possible to place before the dental profession a comprehensive history of dentistry from the earliest times down to the early days of the nineteenth century. Dr. Vincenzo Guerini of Naples, Italy, well known as a dental historian and archeologist, had placed at the disposition of the committee the result of his labors in the field of dental history, which has formed a large and important part of his life-work.

It was the desire of the distinguished author to bring out this book under the auspices of the National Dental Association as a material expression of his appreciation of the contributions which America had made to the progress of dentistry as a profession.

This tribute of the author was sympathet-

ically received by the Committee on History of the N. D. A., not only because of its exceptional merit and the generous sympathy and appreciation which it expressed, but, further, because it furnished in available form and at once the result for which the committee had been created, and for which its members were individually and collectively laboring.

Upon recommendation of the Committee on History, the National Dental Association formally accepted this trust, and pledged its moral support to the enterprise of securing as soon as possible the publication of the work of Dr. Guerini. A thorough canvass of the question from a business point of view disclosed the fact that without a definite, indeed guaranteed market for the book, no publisher could be found willing to undertake the assumed risk of financing the publication, and it was therefore determined by the committee to solicit subscriptions for the work, in order to assure the cost of its publication in advance. Accordingly, and based upon careful estimates, the price of subscription was placed at five dollars per copy, and it was found that not less than 700 copies would have to be subscribed for in advance, in order to guarantee the cost of publication.

By the aid of announcements in the journals, by personal solicitation, and direct appeal by circulars, etc., the present total number of subscriptions received by the treasurer is 550, leaving 150 yet to be obtained before the work of publication can be begun.

The committee asks that all who have not yet subscribed will do so at once. Surely there are enough men in our profession who are interested in its history, and willing to devote five dollars to the securing of such an historical record as has never heretofore been attempted. The matter is ready to put in type, and the book can and will be rapidly put through the press just as soon as the amount necessary to accomplish that end is available for use by the committee.

Send your subscription without further delay to Dr. CHAS. S. BUTLER, treasurer, "The Frontenac," Buffalo, N. Y. Speak of the matter favorably to your colleagues and induce them to do likewise, so that this much-desired object may be consummated without any undue delay. The committee asks that the editors of all dental journals make note of this appeal, and thus lend their important

aid to the cause which the committee hopes soon to bring to a successful issue for the benefit of the whole dental profession.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. MC MANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.
BURTON LEE THORPE, Sec'y, St. Louis, Mo.
CHAS. MC MANUS, Ch'man, Hartford, Conn.

PRIZE OFFERED BY ROTTERDAM DENTAL SOCIETY.

A GNATHO-DYNAMOMETER WANTED.

THE Rotterdamsche Tandheelkundige Vereeniging offers a reward of f. 300 (\$120, £25) for the invention of a gnatho-dynamometer that will be suited for use in dental practice.

The instrument must be able to record a maximum pressure of at least 200 kilograms. Below 20 kgm. the limit of error must not exceed 1 kgm., while with heavier pressure it should remain within 2 kgm.

The bite-contact plates must allow the making of a record within a distance of 1 cm.

Although the instrument has only to record the pressure in one direction, it ought to work also with a moderate lateral movement. With the front teeth, only the pressure with edge-to-edge bite, not with overbite, is to be measurable.

The instrument must be simple, strong, and capable of being sterilized as far as it comes in contact with the mouth. The bite-plates must not do damage to the teeth. When used, the recording apparatus ought to be readjustable.

Competitors are requested to send, free, specimens until October 1, 1908, to the Rotterdamsche Tandheelkundige Vereeniging, 115 Aert van Nesstraat, Rotterdam, accompanied by a motto and a description of the mode of use; and in addition a sealed envelope signed with the same motto, and containing the name and address of the inventor.

The jury is composed of the following dentists: B. Frank, A. A. H. Hamer, I. J. E. de Vries, Amsterdam; C. H. Witthaus, Rotterdam; besides a technical expert. The jury will make its decision in December 1908.

The result will be communicated to all competitors, and their instruments will be returned.

The prize will be delivered in January 1909, during the annual meeting of the Rotterdamsche Tandheelkundige Vereeniging.

Dental and technical papers are requested to publish this notice.

M. ISEREE MOENS, *Sec'y.*

ANGLE SCHOOL OF ORTHODONTIA ALUMNI SOCIETY.

THE second annual meeting of the Alumni Society of the Angle School of Orthodontia will be held in St. Louis, Mo., December 12, 13, and 14, 1907.

MARTIN DEWEY, *Sec'y.*
Argyle bldg., Kansas City, Mo.

INSTITUTE OF DENTAL PEDAGOGICS.

THE next annual meeting of the Institute of Dental Pedagogics will convene in New Orleans, La., December 31, 1907, and January 1 and 2, 1908.

An exceptionally good program has been arranged by the Executive Committee. All dental college teachers are respectfully requested to attend. Full announcement of the completed program will appear in subsequent issues of this journal.

B. E. LISCHER, *Sec'y-Treasurer,*
St. Louis, Mo.

OHIO STATE DENTAL SOCIETY.

THE forty-second annual meeting of the Ohio State Dental Society will be held in the assembly rooms of the Great Southern Hotel, Columbus, December 3, 4, and 5, 1907.

An excellent program of papers, clinics, and exhibits has been prepared. The educational features of such a gathering can be appre-

ciated only by those who are in regular attendance at this and other leading societies, and every ethical dentist of the state should come, and if not already a member, should join.

Should you wish to stop at the Great Southern Hotel it would be well to have your rooms reserved, as there are never accommodations for all—however, other first-class hotels are in the immediate vicinity. Mark the dates off now, and come on the first day and remain through the entire session.

F. R. CHAPMAN, *Sec'y,*
Columbus, Ohio.

MARYLAND BOARD OF EXAMINERS.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates November 6 and 7, 1907, at the Dental Department of the University of Maryland, Baltimore, at 9 A.M. For application blanks and further information apply to

F. F. DREW, *Sec'y,*
701 N. Howard st., Baltimore, Md.

ILLINOIS BOARD OF EXAMINERS.

THE annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the College of Dentistry, University of Illinois, northwest corner of Honore and Harrison sts., beginning Monday, November 4, 1907, at 9 A.M.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal, and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university, or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses

the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary, on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee of twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license, must accompany the application.

Address all communications to

J. G. REID, *Sec'y.*

1204 Trude bldg., Chicago, Ill.

RHODE ISLAND BOARD OF REGISTRATION.

THE Rhode Island State Board of Registration in Dentistry will hold its next meeting for the examination of candidates at the State-house, Providence, November 6, 7, and 8, 1907, beginning each day promptly at 9 A.M. Applications, together with the fee of twenty dollars, if first examination, should be in the hands of the secretary not later than November 1st.

W. S. KENYON, *Sec'y.*

301 Westminster st., Providence, R. I.

CONNECTICUT DENTAL COMMISSIONERS.

THE Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Wednesday, Thursday, and Friday, November 6, 7, and 8, 1907, to examine applicants for license to practice dentistry, and for the transaction of any other business proper to come before said meeting.

All applicants should apply to the recorder for proper blanks and rules for conducting the examination. Application blanks must be filled in and sworn to, and with fee, filed with the recorder on or before November 1, 1907.

By order of Commission.

GILBERT M. GRISWOLD, *Recorder,*

783 Main st., Hartford, Conn.

ARIZONA BOARD OF EXAMINERS.

THE Board of Dental Examiners of Arizona will meet at Phoenix, Ariz., November 11, 12, and 13, 1907, for the purpose of holding examinations. The fee—twenty-five dollars—should be in the hands of the secretary twenty days before date of the meeting.

For further information, address

J. HARVEY BLAIN, *Sec'y.*

Box 524, Prescott, Ariz.

NEBRASKA BOARD OF EXAMINERS.

THE next meeting of the Nebraska State Dental Board will be held at the State-house, in Lincoln, November 18, 19, and 20, 1907. All applications for examination must be in the hands of the secretary at least five days before this date. For any further information address

C. F. LADD, *Sec'y.*

Lincoln, Neb.

OHIO BOARD OF EXAMINERS.

THE regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio will be held in Columbus, November 26, 27, and 28, 1907. Only graduates are eligible to examination. Application, accompanied by fee, twenty dollars, should be filed with the secretary by November 16th. For further information address

H. C. BROWN, *Sec'y.*

185 E. State st., Columbus, Ohio.

MINNESOTA BOARD OF EXAMINERS.

THE next regular meeting of the Minnesota State Board of Dental Examiners will be held in Minneapolis, at the Dental Department of the State University, on Tuesday, November 12, 1907. All applications must be in the hands of the secretary by October 29th, accompanied by the fee of ten dollars.

Examinations begin at 10 o'clock sharp, in

the following subjects: Anatomy, physiology, chemistry, materia medica and therapeutics, metallurgy, pathology, oral surgery, orthodontia, operative and prosthetic dentistry. The practical examination consists of the preparation of a cavity and the making of a gold filling or the preparation of the root and the making of a crown, or both, for a patient supplied by the board. All instruments and materials necessary to perform the required operations must be brought to the examination by the applicant. A diploma from a recognized college must be shown.

Any further information will be gladly furnished by

GEO. S. TODD, *Sec'y*,
Lake City, Minn.

TEXAS BOARD OF EXAMINERS.

THE Texas State Board of Dental Examiners will hold the next semi-annual examination at Waco, Texas, December 16, 1907. For further information address

BUSH JONES, *Sec'y*,
Dallas, Texas.

IDAHO BOARD OF EXAMINERS.

THE Idaho State Dental Board will meet in Boise, December 26, 27, and 28, 1907. Applicants must bring operating instruments and engine.

E. S. BURNS, *Sec'y*,
Boise, Idaho.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Statehouse, at Trenton, N. J., beginning Monday, December 9, 1907, and continuing through the 10th and 11th. Practical operating and practical prosthetic work will begin 8 A.M. Monday. Photograph and preliminary credentials must accompany the application.

For full information address

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

IOWA BOARD OF EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, December 2, 3, and 4, 1907. Written and practical examination will be required. For further information address

E. D. BROWER, *Sec'y*,
Le Mars, Iowa.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held December 3, 4, and 5, 1907, at Masonic Banquet Hall, Manchester, N. H.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

COLORADO BOARD OF EXAMINERS.

EXAMINATIONS granted to holders of diploma only. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any states. Examination the first Tuesday of December, at Denver.

HOWARD T. CHINN, *Sec'y*,
307 Mack bldg., Denver, Colo.

KENTUCKY BOARD OF EXAMINERS.

THE Kentucky State Board of Dental Examiners will meet for the examination of applicants at Louisville, on the first Tuesday in December 1907, at The Masonic, at 9 A.M.

Each applicant shall deposit with the secretary his or her recent photograph, with signature on the reverse side, both of which shall be certified to by the dean of his or her graduating college, or other parties acceptable to the board. Applicants must be graduates of reputable dental colleges.

Applicants shall be examined in the fol-

lowing subjects: Anatomy, Physiology, Materia Medica, Pathology, Histology, Operative Dentistry, Oral Surgery, Chemistry, Metallurgy, Prosthetic Dentistry, Crown and Bridge Work, Oral Hygiene, and Dental Prophylaxis.

Every applicant shall be required to insert two gold fillings; two amalgam fillings; impression, bite, and articulating teeth of upper or lower denture; one bridge on model, consisting of one shell and one Richmond crown and two porcelain-faced dummies; one gold or porcelain inlay or Logan crown—all to be done before the board.

A general average of 75 per cent. is required. Applicants will be graded upon a basis of three-fifths on practical work and two-fifths on theory.

Applicants must come prepared with instruments, engine, and material, excepting

bellows, blowpipe, lathes, stones, and polishing cones. The board would advise the use of gold in the above bridge, as it would cost very little more than German silver after disposing of the bridge.

Application for examination must be made upon blanks furnished by the board and must be accompanied by a fee of twenty dollars, and must be filed with the secretary ten days before the date of examination.

J. RICHARD WALLACE, *Sec'y*,
Louisville, Ky.

ARMY DENTAL CORPS.

DENTAL Surg. Raymond E. Ingalls, having reported, will report to the commanding general, Department of Luzon, for duty. (Aug. 6, Phil. D.)

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1907.

September 3.

No. 865,112, to F. LA CHAPELLE. Method for contouring gold tooth-crowns.

September 10.

No. 865,733, to H. B. WEAGANT. Dental clamp.

No. 865,823, to W. H. TAGGART. Apparatus for making molds for the casting of dental fillings and the like.

September 17.

No. 866,176, to F. AINSWORTH. Artificial denture.

No. 866,304, to F. E. ROACH. Removable artificial denture.

No. 866,305, to F. E. ROACH. Fusible porcelain cement and strengthening backing for artificial dentures.

No. 866,518, to PAUL REPSOLD. Drilling apparatus for dentists.

No. 866,559, to E. E. BARTRAM. Dental plate punch.

September 24.

No. 866,753, to H. E. WEBER. Head-rest.

No. 866,962, to C. RAUHE. Swage for dental crown plates and similar articles.

No. 866,963, to C. RAUHE. Dental bur.

No. 867,193, to E. FLANNIGAIN. Dental soldering apparatus.

THE DENTAL COSMOS.

VOL. XLIX.

DECEMBER 1907.

No. 12.

ORIGINAL COMMUNICATIONS.

ACID AUTO-INTOXICATION AND SYSTEMIC DISEASE THE CAUSE OF EROSION AND ABRASION.

By EUGENE S. TALBOT, M.S., D.D.S., M.D., LL.D., Chicago, Ill.

(Read before the Dental Society of the State of New York, at its annual meeting,
at Albany, May 10, 1907.)

THE prevailing opinion has been, and it is taught today, that the causes of diseases of the mouth, jaws, and teeth are of local origin. Peculiarly is this true of erosion and abrasion, judging from the literature. It has been my purpose in life to devote my time to researches in order to disabuse the minds of the profession of this dormant notion. While it is possible that one or more local factors may enter into the etiology, yet the great factor in all cases of dental pathology is constitutional rather than local. In this paper I shall furnish another proof of these assertions.

No one factor, either local or constitutional, can be accepted as the cause of a given disease. Thus, tooth-decay is due to lactic acid ferment; the great

cause, however, is evolution and degeneration.

Outside of the etiology of tooth-decay, perhaps no subject has caused so much anxiety to the members of the profession as that of erosion and abrasion. The two terms were used by early writers to designate the destruction of the tooth or teeth, erosion being a gradual wearing away of the grinding surfaces of the teeth, abrasion the destruction of the surface of the teeth in connection with the mucous membrane of the mouth. The two terms employed, in the light of my researches really mean one and the same thing, as I shall demonstrate later. It is well, however, to retain the two terms, because they indicate, to a certain extent, the location of tooth-destruction.

In my papers, "Pulp-Degeneration,"* "Constitutional Causes of Tooth-Decay,"† "Constitutional Causes of Tooth Decay, Erosion, Abrasion and Discoloration,"‡ I demonstrated that the teeth at different periods of life soften and discolor in circumscribed areas or as a whole, as a result of nerve-end and artery degeneration due to disease, especially nerve diseases, neurasthenia, nervous breakdown, and faulty nutrition. In many of my earlier papers I have shown that in nearly every diabetic, tabetic, or paretic dement, erosion and abrasion were present. These changes in nerve-end and arterial degeneration due to malnutrition and auto-intoxication affect the pulps of the teeth and alveolar process, and cause destruction of cement substance between the enamel rods and alter the vitality of tooth-structure.

Prof. James Truman of the University of Pennsylvania did research work on erosion many years ago. He was dissatisfied with the many theories then extant and made some researches along this line. Satisfied that it was the result of acid action which had not its origin in the cause of caries, he undertook a series of tests. The result demonstrated that there was no positive reaction in the mouth during the day. The exceptions were not worthy of consideration. He then sought to discover when and where acid was formed—as acid, in his opinion, it must be. Another series of tests were made at night, or rather before rising in the morning. He naturally began upon himself, and found invariably a distinct acid response. Then he secured the co-operation of a number of students, who were to bring the results to him. This confirmed the conclusion that at night, when the secretions are quiet and the alkaline saliva practically ceases to flow, fermentation sets in and a marked acid reaction takes place. It is during these periods of rest, therefore, that the greatest amount of tooth-destruction takes place. The mucosa falling upon

the anterior teeth, and frequently on the buccal surfaces of the posterior, slowly but surely eat a place in the enamel. The polishing is accomplished by the constant passing of lips, tongue, food, etc.

The treatment he adopted seemed to prove the acid theory. He used in all cases a magma of precipitated chalk (chalk-and-water paste), placing it under the lip at night. The result was a cessation of the destruction. His wife's nephew at eleven began to show destruction of the enamel on both laterals. He was too young to have the cavities assume the phenomena of erosion, but he placed him under the chalk treatment. He is now over thirty, and the teeth have remained as they were at that time. Abrasion is due not to mechanical wear alone, but to the combination of acid action and attrition.

Dr. Michaels of Paris has done considerable work on hyperacidity of the saliva, and has determined that when the blood becomes of a lessened degree of alkalinity because of the accumulation of acid products not eliminated from the system, the secretions and excretions of the glands become acid in reaction.

I accept the acid theories of Truman and Michaels of erosion and abrasion. that the acid is deposited upon the teeth from the mucous glands and gums, that the action of acid upon the teeth is greater at night than in the day, because the saliva practically ceases to flow at night. But does not the saliva, which normally is alkaline, sometimes become acid? Is the acid from the mucous glands due to "fermentation"? Do chalk preparations or other antacids applied under the lips night or day, or both, stop the formation of acid and thus prevent erosion and abrasion? Clinical experience says not. That the action of acid upon the teeth is retarded when the treatment is faithfully conducted for months and years is true. When occasionally applied, or when applied for a short time, the results are only temporary.

The causes which produce erosion and abrasion may be one of three factors. or all three may be necessary. First,

* *Journ. Amer. Med. Association.*

† *Dental Digest*, December 1903.

‡ *DENTAL COSMOS*, November 1904.

change in tooth-structure, due to systemic changes and disease; second, secretion of acid by the mucous glands; and third, friction by the action of the teeth on one jaw against those of the other, from foreign bodies, or by action of the lip or cheek. Soft areas, due to change in the teeth by systemic diseases, may be worn away by the action of acids direct from the glands, or by the action of the lips and cheeks, or by friction of foreign substances. Acid secretions alone will in time destroy normal tissue. Friction by foreign agents or by the teeth of one jaw against those of the other, without acid, will in time also destroy normal tissue.

Since local applications will not destroy the acid mucus or restore acid saliva to alkalinity, its normal condition, the question naturally arises, How is this acidity produced? In my studies upon the urine in relation to auto-intoxication causing interstitial gingivitis, I was struck by the coincidence of the abnormal degree of urinary acidity with this condition in many cases. In these mouths, erosion and abrasion were frequently observed. This important discovery led me to examine the urine in every case where erosion and abrasion were present, to discover if acid intoxication was present. One phase of auto-intoxication, that of acid intoxication in relation to erosion and abrasion and incidentally to interstitial gingivitis, is the subject of this paper.

The greatest destruction of the teeth was upon the labial, buccal, grinding, and palatal surface as observed in diabetics, tabetics, parietic dementes, and lutetics.

The degree of acidity of the urine in my own patients, and in those of physicians and in public institutions, ranged as follows:

DEGREE OF ACIDITY IN DIABETICS.

Through the kindness of the Columbus Medical Laboratories, I was allowed to make a report of the urine of diabetics sent to them for examination. Three hundred and ninety-four examinations

were made. Two passed 4 degrees, two 6, one 7, two 8, six 10, five 12, sixteen 14, one 15, fifteen 16, one 17, thirteen 18, twenty 20, one 21, twelve 22, one 23, ten 24, two 25, fourteen 26, sixteen 28, one 29, twenty-two 30, seventeen 32, thirteen 34, four 35, twenty 36, two 37, eleven 38, two 39, thirteen 40, one 41, eight 42, seven 44, two 45, eight 46, two 47, five 48, five 50, five 52, one 54, twelve 56, one 57, four 58, five 60, one 62, one 63, three 64, two 66, two 68, two 70, three 72, one 74, one 75, one 100, two 104, one 120.

Acetone. Of this number of cases, only nineteen were examined for acetone; in 11 acetone was present, in 8 absent. Thirty-two were examined for di-acetic acid; in 6 it was present and in 26 absent. Twenty-four were examined for B-oxybutyric acid; in all it was negative.

Uric acid. The examination for uric acid of three hundred and seventy patients showed it present to a greater or less degree in 56 and negative in 314—or about 15 per cent. had uric acid.

DEGREE OF ACIDITY IN TABETICS.

Of thirty-five tabetics, one passed 5 degrees, one 6, four 9, two 10, one 11, one 17, two 19, two 20, one 22, one 46, one 48, one 49, one 50, one 56, one 62, one 73, one 76, one 78, one 81, one 82, one 84, one 97, one 99, one 112; four were alkaline. The patients having the alkaline urine had marked erosion of the teeth, showing that at some time there had been a high degree of acidity. Cystitis caused the urine to become alkaline. All showed indican to a greater or less extent.

DEGREE OF ACIDITY IN PARETIC DEMENTES.

Twenty-one males, four females. Three passed 5 degrees, one 7, three 8, two 9, one 10, one 11, one 12, one 13, one 15, two 16, one 17, one 22, one 28, one 34, one 38, one 39, one 44, one 51, one 52, one 70. The patients were in a quiet state. If the urine could have been examined after excitement or an explo-

sion, the degree of acidity would have been greater.

DEGREE OF ACIDITY IN LUTETIOS.

One passed 24, one 96, one 105, one 116.

DEGREE OF ACIDITY IN PRIVATE PATIENTS.

In my own practice one hundred and thirty patients were examined. Three were also sent to me by Dr. J. F. Keefe of Chicago. All ranged from eleven to eighty-four years of age. All showed erosion and abrasion to a greater or less extent. Three passed 2 degrees of acidity, three 8, two 10, two 11, seven 12, two 14, two 15, five 16, six 18, two 19, eight 20, five 22, five 24, six 26, four 28, two 29, six 30, two 31, four 32, two 33, three 34, nine 36, two 38, two 40, two 44, five 46, one 47, two 48, two 50, five 52, five 54, four 56, one 58, three 60, two 62, five 70, one 90, one 115, one 117, one 132; only four, or $3\frac{1}{8}$ per cent., had uric acid.

I quote here from a previous paper, "Interstitial Gingivitis due to Auto-intoxication,"* my first fifty patients' degree of acidity: One passed 11 degrees, two 12, one 14, two 15, one 16, two 17.5, four 20, one 22, one 24, five 30, seven 36, two 40, two 44, one 46, two 56, one 58, one 59, one 60, two 62. Three per cent. had uric acid; all had indican.

The method of obtaining the degree of acidity of the urine is given by Neubauer and Vogel.† The instruments necessary for this work are—One burette 50 ccm.; one wooden stand; one Barnes dropping bottle; one 10 ccm. graduate, and one small glass. Place the burette in the wooden stand in an upright position; fill the tube with the solution (deci-normal sodium hydrate) to exactly 0. The degree of acidity is obtained by taking 10 ccm. of the urine specimen, measured in the graduate glass and then placed in

the small glass; add four drops of phenolphthalein solution as indicated, and then adding drop by drop NaOH (deci-normal solution sodium hydrate) until a slight pinkish color is produced. Having noted on paper the number of ccm. of the NaOH in the burette before and after the pink color is obtained, the number of ccm. displaced multiplied by 10 (in order to find the number of ccm. NaOH necessary to reduce 100 ccm. urine) equals the degree of acidity. Each step in this operation must be carefully performed: each instrument and the surroundings must be kept perfectly clean in order to get good results.

The normal degree of acidity of the urine is from 30 to 40 degrees. When the degree is below 30 (the difference between the degree indicated and 30 shows the degree retained in the system), it indicates either renal insufficiency or excessive suboxidation products, producing renal strain. In cases in which the degree of acidity exceeds 40, there is excessively imperfect oxidation, which, irrespective of the types of acid, underlies, as is now pretty generally recognized, severe constitutional stress allied to that of diabetic acidosis.

There are two great functions of the kidney, excretion and elimination. Excretion does not necessarily imply elimination. Indeed, many of the polyuric states (increased excretion), as in diabetes, in lues, and in the states with nervous urine, are attended by decided decrease of eliminatory power. Imperfect oxidation states may act in two ways on the kidney. They may increase its excretory powers at the expense of its eliminatory power, causing what is known as renal insufficiency. In this case a lessened proportion of the substances usually eliminated occurs in the urine, the rest being retained in the circulation. On the other hand, an increased proportion of the products of suboxidation beyond normal generally occurs where there is an increased production of these in the system. A decreased degree of urinary acidity is attended by symptoms due to the retained acids. An increased manufacture of acid in the system is attended by

* *Dental Digest*, 1906.

† "Guide to the Qualitative and Quantitative Analysis of the Urine," English edition. Wm. Wood & Co., 1879.

an increased degree of urinary acidity, which increased degree, however, very often indicates a disproportioned elimination of the acid products actually present in the system. The degree of acidity must be obtained as soon as possible, since the free acids or alkalis cause fermentation of the urine.

It is claimed that fruit acids are converted into alkaline substances in the system. This is only partially true. The liver and tissues become overworked. Acids which are taken into the stomach as food are in excess and are stored up in the system.

The fruit habit (especially grape-fruit), so generally indulged in to excess in America, is producing havoc in the alveolar process, gums, and teeth.

One case is sufficient illustration of the many I am called upon to treat. A woman, twenty-seven years of age, had her teeth and mouth put in good condition in January 1907. On February 16th she returned with what she thought a cavity at the cervical margin of the upper left canine. Upon examination I found the gums inflamed and receding, not only at that particular location but about all the teeth. Previous to this the gums and mucous membrane were in fairly good condition. Litmus test showed the mucus to be very acid. There was no cavity, only sensitive dentin. Much gas was passing from the stomach. Upon interrogation in regard to her food, she informed me that she had been eating grape-fruit every morning for three weeks. Urinalysis of a twenty-four-hour specimen showed the degree of acidity to be 14 degrees; 16 degrees were retained in the system. The recession of the gums and the sensitive dentin were due to the acid retention.

Wherever there is an endogenous or an exogenous poisoning with which the liver is unable to cope and the strain is thrown on the kidney, elimination proceeds through the skin, the nasal and buccal mucous membranes, and hence through the alveolar process, since the last contains end-organs in which useless products settle. This produces, for example, the blue line of lead poisoning,

the green of copper, and the red of mercury.

The tendency to graver diseases as here represented is shown in interstitial gingivitis and absorption of the alveolar process.

The acidity referred to in this paper is not to be confused with uric acid, as I have already shown in this and other papers. About 3 per cent. of office practice have uric acid, while 15 per cent. of patients suffering with disease, such as diabetes for example, have uric acid. All persons, sick or well, at some period have acid auto-intoxication.

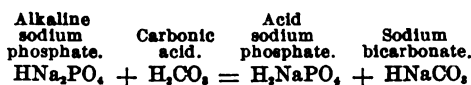
Dr. J. H. Salisbury, in his article "The Alkalinity of the Blood in its Physiologic and Pathologic Relations,"* says: "The alkaline reaction of the human blood is maintained in spite of the constant entrance into the blood of acids, either taken as food or generated by fermentation in the intestine, or produced as the result of metabolism in the various tissues. . . . All these acids entering the blood tend to reduce its alkalinity, and if this tendency were not counteracted the reaction of the blood would soon become neutral or even acid. The mechanism by which the reaction of the blood is regulated and its alkalinity is maintained is of the greatest interest and practical importance to the physician. . . . This compensation is mainly secured by the excretion of acid sodium phosphate, which is produced by a reaction between sodium bicarbonate and di-sodium hydrogen phosphate, which results in the passage of the acid phosphates into the urine and the retention of the more alkaline sodium carbonates in the blood."

Since the skin and the mucous glands of the mouth become acid, it is suggested by Brubaker† that the waste products of faulty metabolism occurring in gout and kindred conditions, floating through the capillaries of the labial glands, produce irritation and the production of an excess of carbon dioxid. This exists in the cells of the glands as carbonic acid, H_2CO_3 , and, combining with the alkaline salt

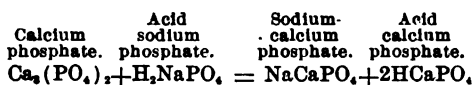
* *Medicine*, July 1899.

† *Internat. Dental Journal*, December 1894.

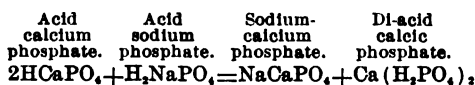
sodium phosphate derived from the blood, the following reaction occurs:



The acid sodium phosphate formed attacks the phosphate and carbonates of calcium composing the teeth in a double reaction after the manner shown in the following equation:



The acid calcium phosphate is further acted upon by additional molecules of the acid sodium phosphate (di-hydrogen sodium phosphate) as follows:



The di-acid calcic phosphate is freely soluble and is doubtless washed away.

To note the acidity of the mouth, take a strip of litmus paper, hold it over ammonia until it is quite blue, and apply it under the lips upon the gums, holding it in position for a minute or two. If the mucus be acid it will turn the blue paper red; if it be alkaline, the paper will remain blue. This method is only partially satisfactory, and means very little so far as the urine is concerned. A more satisfactory method for the urine is that already mentioned.* A still more simple method (since the agents are at hand) is to use phenol-phthalein as an indicator. Place a small quantity of urine in a glass, add drop by drop the phenol-phthalein. If acid it remains colorless; if alkaline, it is pink. If the litmus paper shows the mucus to be acid and there is an abnormal degree of urinary acid reaction, the chain of evidence is complete. Professor Truman, therefore, is entitled to credit for his early researches in this direction.

The literature upon the subject of acid auto-intoxication is meager and does not extend back many years. Different terms

have been substituted for acid intoxication in later years, such as acetonuria, acetonemia, aciduria, and acidosis. Acetonuria was first recognized in diabetes by Petters in 1857. Garhardt about 1880 demonstrated acetone associated with di-acetic acid and B-oxybutyric acid in the blood in diabetic patients. The so-called acetone bodies, acetone, di-acetic and B-oxybutyric acid, are symptoms of disordered metabolism. All three of these acids are closely related. According to T. Stuart Hart,* by oxidizing B-oxybutyric we obtain di-acetic acid, and when di-acetic acid is heated to 100° C. it is easily decomposed into acetone and carbonic acid. Later it has been shown that acetonuria occurs under other conditions and in other diseases, such as scarlet fever, erysipelas, diphtheria, pneumonia, etc. All the depressed mental states, whether occurring singly or in compound psychoses, like parietic dementia, cyclothymia, katatonia, etc., are attended by suboxidation, as Meynert long ago showed; hence, as Coriat† has lately proved, by acid states, acetone, di-acetic, and B-oxybutyric acid.

Dr. James Kelly‡ has shown that acetone, di-acetic acid, and B-oxybutyric acid in the urine have been recognized in the following classes of patients: (1) In the late stages of diabetes mellitus; (2) in starvation; (3) in malignant growths; (4) in digestive disturbances; (5) in septic processes, general or local; (6) in infectious fevers; (7) in pregnancy associated with a dead fetus; (8) in certain psychoses; (9) in auto-intoxications; (10) in chronic morphinism; (11) in phosphorus poisoning; (12) following general anesthesia; (13) in injuries to the cerebro-spinal system; (14) in shock due to injury; (15) in cases associated with fatty liver, and probably (16) in cases of uremia.

Research work upon acid intoxication and the acetone bodies is in its infancy. Most of the work of value has been done

* *Amer. Journ. of the Med. Sciences*, August 1906.

† *Amer. Journ. of Insanity*, April 1902.

‡ *Annals of Surgery*, February 1905.

* "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris," p. 184.

since 1900; the greater part of it has been written in the past two years.* For our purposes, in this paper on erosion and abrasion we must limit discussion to acid intoxication, since the urine of ordinary office patients suffering with erosion and abrasion does not contain the acetone bodies.

With the urine, in evolution, comes an increased oxygenation, and with this a decreased acidity in the urine excreted. The normal degree of acidity in the urine is from 30 to 40 degrees. Unnatural methods of living, such as excesses in eating and so-called simple food, alcohol abuse, etc., will cause an excess of the acidity in the system. Disease or pregnancy will also change the degree of acidity. For example, in the simple cold of a child five years of age, the degree of acidity was 90. This degree of acidity was readily reduced in ten days, therefore the effect upon the teeth, gums, and alveolar process is *nil*. On the other hand, in a case of pregnancy, where an abnormal degree of urinary acidity may extend over a period of six to nine months, some destruction of the alveolar process and teeth is bound to occur. Since the alveolar process, gums, and teeth are transitory structures as well as end-organs, the destruction is more rapid than in other parts of the body. The gums are especially affected in systemic changes, since they possess sensitive glands.

What, then, must be the condition of the urine in those persons who have lues, tuberculosis, Bright's disease, diabetes, and nervous disorders, and in high-livers whose abnormal degree of acidity has continued for many years. It will be readily understood how almost instantaneously erosion and abrasion may begin upon the teeth, and how almost instantaneously the destruction will cease on a change in methods of living and a restoration to health. A sea voyage, a trip to Hot Springs, or a complete change in environment, will reduce the acidity of the urine to nearly or quite normal. The secretion of acid from the mucous glands and gums

will cease. This accounts for the fact that in some of the examinations the urine was normal in acidity. The fact that erosion and abrasion were slight or severe in a given case, and that urinalysis showed the urine to be normal, does not prove that it had been always so. In some of the patients, especially those with nervous diseases, the urine was found to be alkaline. In these cases the destruction of the teeth was unusually marked. The degree of acidity was not checked in the system, but the patients were suffering from cystitis and the urine became alkaline in the bladder.

In any condition where there is an irregular strain on the heart in circulation, as there is in business and other strains, there occur imperfect oxidation, imperfect hepatic action, and imperfect renal elimination. All these conditions together or singly produce metabolic changes underlying acid states.

In the papers mentioned at the beginning of this article, a number of patients were described who from overwork, grief, mental depression, and nervous disease had rapid decay of the teeth, destruction of the alveolar process (interstitial gingivitis), erosion, abrasion, and discoloration. I have gone into detail as to the cause and have demonstrated microscopically artery and nerve-end degeneration of the pulp and alveolar process, which produce change in tooth-structure—softening of the entire structure or areas.

The lessened degree of alkalinity of the blood, or acid intoxication of the system, causes contraction of the arterioles, lessening the blood supply and causing vaso-motor neuroses and arteriosclerosis in end-organs such as the pulp and alveolar process. The teeth change color with age, just as the excretory organs become senile and sluggish and the blood thin, the result of acid auto-intoxication. In sickness, also, the teeth that were once hard change color, soften and decay. Acid auto-intoxication is caused by over-production and want of proper elimination. In pregnancy faulty metabolism and acid auto-intoxication is present, the teeth discolor and soften, and

* *Annals of Surgery*, February 1905.

decay is rapid, but in most cases the system is restored to normal after childbirth and the teeth to a degree recover their color and strength. In close and frequent pregnancies, however, the effect is more demonstrable and lasting. In scarlet fever Bright's disease often results, from kidney insufficiency, the teeth decay rapidly, and interstitial gingivitis is very marked. The system is overcharged with acid auto-intoxication. It would seem that the acidity of the blood acts directly upon tooth-structure from without and within, causing discoloration, softening, and destruction of cement substance between the enamel rods, as particularly observed in diabetics. In luetica, diabetics, tabetics, and parietic dements these changes are most marked. There are many other diseases, particularly those of faulty metabolism, in which similar results are obtained. Petres and Vaillard have shown that in typhoid fever nerve-end degeneration takes place. Later observations have shown changes in nerve-ends and arteries in tuberculosis, leprosy, diphtheria, alcoholism, carcinoma, inanition, marasmus, and arteriosclerosis, in the so-called rheumatic neuritis of the facial nerve and in inflammation due to articular rheumatism, in gout, puerperal infection, drug poisons, etc.

To illustrate how effectually nervous breakdown will cause nerve-end and arterial degeneration, tooth-softening, and discoloration, I will describe one of my own cases: Mr. A., sixty years of age, from mental and physical overwork broke down in August 1906. He had been a patient for thirty years and had been under constant observation. His gums and teeth were in perfect condition, had not had a tooth filled or gums treated for twenty years. The teeth were cleaned regularly every six months. The teeth were hard as flint. After the breakdown severe pains were felt throughout the body, especially in the lower and upper extremities. A space upon the left leg above the knee the size of the hand was cold and numb. A gold filling in the mesial surface of the right central incisor dropped out without decay. Dis-

integration of the enamel is taking place about the approximal filling in the left central. The enamel around gold fillings in the lower left first and second bicuspsids and first and second molars have already begun to disintegrate, and erosion is plainly visible. The gums and alveolar process are beginning to recede about the upper left molars. Litmus tests show marked acidity of the gums and lips. Urinalysis at different periods between December 1, 1906, and January 1, 1907, shows the following degree of acidity—11, 12, 20, 32, and that from 10 to 19 degrees of acidity were retained in the system until it was reduced to normal, above 30. How long the excessive acid state had existed in the patient I am unable to say; probably for some time.

In some patients nerve-end and arterial degeneration are so rapid that the pulps of teeth are destroyed and erosion causes exposure of the empty pulp-chamber. In others the arteries are destroyed, leaving sensitive filaments of nerve fibers in the pulp-chambers. Since the constant use of the tooth-brush, or friction from other causes, with a slight acidity of the secretions of the mouth, will destroy healthy normal tooth-structure, how much more quickly will it destroy areas or entire tooth-structure when changed by disease! When pulp-degeneration and destruction of the alveolar process occurs, the tooth above the healthy line of the periodontal membrane is dead. This accounts for those anomalies referred to in Figs. 106, 107, and 108, "American System of Dentistry,"* where all the teeth are worn to the gums; and in those cases where the carbonates and phosphates are removed and only the animal tissue, resembling horn, remains. Nerve-end and arterial degeneration only will account for the frequent occurrence of erosion and abrasion of the central incisors, upper and lower, in many cases, while all the other teeth are normal.

The gums, the alveolar process, and the pulp of the tooth, being end-organs as well as transitory structures, are the

* Vol. iii, pp. 415, 416.

first to feel the influence of metabolic changes and auto-intoxication. Destruction of tissue is the result.

In these days of prophylaxis, the dental profession has an advantage over the medical in the fact that the laity seek the services of the dentist two or three times per year and can be forewarned of the approaching storm, while the physician is not called until the storm has broken. The subject of interstitial gingivitis in relation to acid auto-intoxication was discussed in a previous paper (*Dental Digest*, 1906).

TREATMENT.

The treatment consists in reducing the acidity of the urine to normal, 30 to 40 degrees. This is accomplished by giving the (adult) patient from ten to thirty grains of sodium bicarbonate, or sodium chlorid one-half teaspoonful (forty-five grains) after meals, or sodium phosphate, morning and evening; one-tenth grain of calomel every two hours until a grain is given to stimulate the liver and cleanse the bowels. This may require from one to four weeks or even longer; frequent urinalysis will determine the time. If indican be still present, intestinal anti-

septics are indicated. Eight to ten glasses of water should also be taken daily.

The matter of diet and hygiene is all-important in this connection. No definite rule can be laid down; each patient must be advised according to symptoms. There are, however, a few general rules which may be prescribed in all cases. First, discard all meats, using chicken, fish, and vegetables instead. If the acidity be due to sugar fermentation, avoid starchy foods and sugars. In some cases fruits (cooked or uncooked) must not be used; in others liquids must be discarded at meals. Coarse foods must be eaten, with plenty of time to masticate and thoroughly insalivate them before swallowing. Hot baths and a general cleaning out and up are indicated, with plenty of outdoor exercise in the sunshine. Local treatment of the gums is necessary.

I am obligated to the following physicians for their assistance: Dr. Sidney Kuh, Cook County Hospital; Dr. S. M. Robin, Cook County Hospital for the Insane and Poorhouse; Dr. W. A. Evans, Columbus Medical Laboratories; Dr. Adolph Gehrmann, Columbus Medical Laboratories; Dr. J. F. Keefe, and Dr. J. G. Kiernan.

PIERRE FAUCHARD.

By CHARLES McMANUS, D.D.S., Hartford, Conn.

(Read before the Dental Society of the State of New York, at its annual meeting, at Albany, May 10, 1907.)

AT the risk of increasing my reputation as a "snapper-up of unconsidered trifles," I have ventured to bring for your consideration a period in the history of the dental art which would be of interest only to the dental antiquarian were it not for the illuminating presence of one man who has been very

justly called the "father of dental surgery."

If Dr. Samuel Johnson was right in his definition of a genius, as "a mind of large general powers accidentally determined in some particular direction," then we can claim that rare distinction for the great personage—for he deserves

no less a title—of whom I propose to speak this evening.

Before passing to the subject of my paper it might be well to follow the method that Mr. Belasco has found of value in mounting his plays, and attempt to "create an atmosphere."

THE EARLY FRENCH SURGEON-DENTISTS.

Nearly four hundred years ago the great French barber-surgeon, Ambroise Paré, began his long and wonderful career. He has been termed the "father of modern surgery," but as he was greatly interested in dental surgery—as many passages in his books show—we can proudly claim him as the foster-father of our own profession. His instruments and methods were crude, but the man himself was broadminded, as a passage in his larger work on surgery bears witness. Instead of keeping secret his inventions, as was the custom of his time, he made them as public as possible, saying, "For my part I have dispensed liberally to everybody the gifts God has conferred upon me, and I am none the worse for it; just as the light of a candle will not diminish no matter how many may come to light their torches by it."

In passing, it is interesting to note that Paré's record, as surgeon to four kings of France, was equaled later by Dubois-Foucou, who was dentist to Louis XVI, Napoleon, Louis XVIII, and Charles X. But long before his time dentists were attached to the court of France. Pierre de la Brosse attended Saint-Louis; Thomas de Pisan, Charles V; Delaurent, Henry IV; Dupont, Louis XIII. As for Louis XIV, he was continually in trouble, perhaps because he had five dentists—François le Bert, Dubois, and Arnauld-Forgeron among the number. Louis XV, employed Forgeron, Caperon, and Bourdet. We not only know the names of these men, but the records of many of their fees are to be found in the French archives.

But there is another side to this picture. They had their quacks and

mountebanks—the flamboyant ancestors of the somewhat more genteel individuals that infest dentistry today. All through the seventeenth and a great part of the eighteenth centuries they plied their trade, usually on the Pont Neuf. The most notorious of them all was the "Great Thomas"—whether so called for his stoutness, his good nature, or his own opinion of himself, it is hard to say. His hat is worthy of a moment's attention; it was said to be of massive gold—probably a slight exaggeration, but it certainly was highly ornamented with the crowing cock of *Æsculapius* or Paris. The statement that he was "grand operator to the king" was simply a lie, but that he was unequaled, that he painlessly extracted the firmest teeth, free of charge, for his good people of Paris, we can readily believe of any person wearing such a hat! But let us leave these ancient charlatans and consider real dentistry.

We get an idea of some of the dental instruments used at the beginning of the eighteenth century from the book of the celebrated surgeon and anatomist of Paris, Pierre Dionis, published in 1718. He speaks of Guillemeau (1710) who made artificial teeth from a composition of his own invention—a paste composed of pure white wax, gum, white mastic, coral, and mother-of-pearl. Dionis says that teeth made of this composition never became yellow, and that it was also good for stopping decayed teeth. Can this be the germ of the porcelain filling?

FAUCHARD.

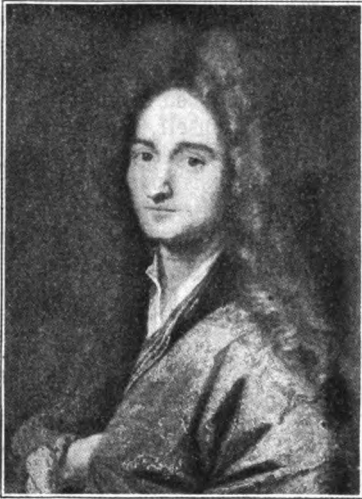
But we now come to the man Pierre Fauchard, of whom Chapin A. Harris said, "He was one of those masters in science who appear from time to time in every department of intellectual inquiry, and whose extraordinary capacity and acuteness enable them to prepare, in the brief space of their active life, material for the full occupation of generations of ordinary men who succeed them."

Born in Brittany toward the close of the seventeenth century—the date 1690

usually given being much too late—he was destined by his parents for the practice of surgery, but was at first prevented from following that vocation on account of family troubles.

“From my youth,” says Fauchard, “I was destined to the surgical profession; the other arts I have practiced have never made me lose sight of it. I was the

FIG. 1.



PIERRE FAUCHARD.

(From a photograph of the original painting, attributed to Netscher, 1726.)

disciple of Alexandre Poteloret, surgeon-in-chief to his majesty's ships, who had great experience in diseases of the mouth. To him I owe the first rudiments of the knowledge I have acquired in the surgical specialty I practice, and the progress I made under this able man gave me the emulation that has led me to further important discoveries.”

How well he speaks of his preceptor!

Viau says that Fauchard had tried several mechanical pursuits, the practice of which proved to be not without value to him later on. In fact, it was the preliminary manual training he was unconsciously receiving.

He was fortunate in studying under Poteloret, for this naval surgeon was experienced in oral troubles, especially in

scorbutic disorders, which at that time were frequent on vessels making long cruises. When Colbert organized the French navy he instituted a health service, which—let us be thankful!—was not too strict in its entrance requirements, and thus Fauchard was able to join as assistant. His service in the marine corps did not continue long, for in 1700 he took up his residence in the university town of Angers, afterward traveling from town to town to make a livelihood, visiting Tours, Rennes, and Nantes, at fixed dates. And we may say of him—as was said of Chapin A. Harris more than a century afterward as he traveled from town to town in the West—that wherever he went the public estimation of dentistry was elevated, and his own reputation was established.

At first acting as dentist to the needy population, as remarks in his book prove, he gradually succeeded in acquiring a more select and lucrative *clientèle*. Although his fame increased and people came to seek him from the depths of Brittany, he determined to test his abilities on a larger scale, and in 1719 went to Paris, where at this time, and even earlier, as we have seen, there were not only the tooth-pullers of the Pont Neuf, but also dentists properly so called. Indeed, Fauchard mentions the examination that aspiring dentists had to undergo, as far back as the year 1700, nearly one hundred and fifty years before the mountains of Alabama were in labor and our own first dental law was born.

A RECOGNIZED NEED.

That France was not alone in a desire for a higher education for dentists is shown by a document of about the same date in the Venetian archives, in which a magistrate of Venice, writing to the college of Padua, says: “In the lessons of surgery the affections of the teeth in general are spoken of, but it is to be regretted that there are no public courses treating of the subject. It would be equally useful to establish a special school.”

In the preface to his book Fauchard

says: "There does not exist any public or private course of surgery in which the theory of dental maladies is amply taught, and in which one can receive fundamental instruction in this art, so necessary for the healing of these maladies and of those of the neighboring parts. This branch of the art having been but little cultivated, if not wholly abandoned by the most celebrated surgeons, their negligence has caused it to fall into the hands of persons without theory and without experience, who practice it in a haphazard fashion, guided neither by principles nor method. In Paris it is only since 1700 that people's eyes have been opened to this abuse. In this town those who intend to become dentists are now obliged to undergo an examination, but although the examiners be most learned and well versed in all the other parts of surgery, I think, if I may be allowed to express an opinion, that as they do not ordinarily themselves practice dental surgery, it would not be amiss on these occasions to admit an able and experienced dentist, who might sound the aspirants as to the difficulties which have come before him in the course of the long practice of his art, and who could communicate to them the means of surmounting them. In this way one would not have to admit that the knowledge of the greater part of 'dental experts'—*experts pour les dents*—is below mediocrity," the term "dental expert" being probably the title which was bestowed in the diploma or certificate given to those who passed the examination in question.

"To supply this want of instruction," continues Fauchard, "it would have been of great use if some able dentist—for example the late Monsieur Carmeline, who in his day practiced with general applause—had made us acquainted with his mode of operating and with the knowledge acquired through the successful treatment of a great number of important cases. What this celebrated surgeon-dentist has not done, I, today, dare to undertake; I shall at least afford an example of what he might have done with greater erudition and better success."

The reason why many dentists before the time of Fauchard published scarcely anything concerning their art was, perhaps, because of an existing sentiment of jealousy which rendered them—that is, the best part of the profession and therefore the ones most capable of writing—but little disposed to make known to others the results of their studies and of their experience, lest the fruits of their long labors should be utilized by others, and they themselves be materially damaged by competition. That this sentiment of jealous egotism existed among dentists two hundred years ago may be in a manner deduced from a few words of Fauchard himself, in which, when making known a certain improvement in dental prosthesis invented by him, he at the same time expressed his conviction that in so doing he was acting against his own selfish interests. His words are—"To the prejudice of my own interests I now give the most exact description possible of this invention."

That he was among the very first to realize the necessity for a broader medical education may be seen in the following quotation: "It is strange," writes Fauchard, "that the sovereigns of foreign countries, the heads of republics, and also the administrators of our own provinces, do not provide for the expense of sending young surgeons to Paris to be instructed in a part of surgery so essential, and, notwithstanding, so ignored and neglected everywhere excepting in this great city, where it has reached its highest perfection, both as regards the embellishment of the mouth and the cure of diseases often of a most serious character. These scholars would thereafter form others and would render great services to their nation and their fellow citizens."

It is not strange that this broadminded gentleman met with success in Paris, and quickly had for his friends not only the well-known dentist Carmeline, but also the surgeons of the Faculty of Medicine and the physicians of the court. De Jussieu, Louis Petit, Helvétius, La Peyronnie, Hecquet, and others, held him in such high esteem that they recommended

their patients to him, and even consulted him in certain cases pertaining to his specialty.

FAUCHARD'S GREAT WORK.

Viau says: "His success and the experience he had acquired incited him to the desire, common to all, that his name should survive by making his successors benefit by the knowledge of a science and of an art he had renewed or created; for before his time there was no book worthy of such a name."

Fauchard's great work, "*Le Chirurgien-dentiste*," was first published in Paris in 1728, in two duodecimo volumes of over eight hundred pages, with forty full-page illustrations. Dr. Wm. H. Trueman says concerning it: "The book was carefully written and was practically completed about 1723, but, feeling the importance of making it as accurate as possible, Fauchard submitted the manuscript to a medical friend for additions and corrections; he further waited to consult a forthcoming work which promised desired information, and finally, before committing it to the press, placed it in the hands of a competent scholar to be 'schoolmastered.'" The "medical friend" referred to was undoubtedly the Parisian surgeon and prolific writer, Jean Devaux, who was born in Paris, January 29, 1649, and died May 2, 1729, aged eighty years. Pierre Sue *le jeune*, master surgeon of Paris, in his eulogy of Devaux, published in 1772, attributes a good part of the success of Fauchard's work to the help given him by the aged writer. This does not in any way detract from the reputation of Fauchard, but is the more interesting as it shows a young man and a very old man working together, as was the case a century later with Hayden and Harris.

"To many of the present day," says Dr. Trueman, "this work of Fauchard's would be a revelation. His knowledge of the teeth and their surroundings, of their diseases and proper treatment, of operative procedures needful to prevent or to remedy untoward conditions, show

how far advanced the art and science of dentistry was nearly two hundred years ago. It is much to be regretted that this book was not translated into the English language at a time when the information it contained would have had practical value. It was, in my judgment, far more deserving, and would have proved far more useful than did others which were so honored."

One cannot but regret that the dental pioneers of our own country were not sufficiently versed in the French language to have availed themselves of this rich fund of practical information. As that dental bibliophile, Dr. Grevers of Amsterdam, has said, "I feel that it is a great pity, when many old writings were republished by the American Society of Dental Surgeons, that we should find the book of Delabarre translated, while the work of Fauchard has been neglected."

Although never translated into English, it was in 1733, five years after its first appearance, printed in German, at Berlin, embellished with a portrait of the author, and subjoined verses, which also appeared in the second French edition of the work in 1746. (Fig. 2.) This was in accordance with the proper fashion of the time, and is interesting for two reasons—the first being that Fauchard is revealed to us as a person of very distinguished appearance, and this gives us a hint as to the social condition of the better class of dentists in Paris during the reign of Louis XV; and second, because of the verses annexed to the portrait, which Dr. Wm. H. Trueman has cleverly put into English rhyme as follows:

Whilst Fauchard with wise hand and pen
For health and beauty of the teeth contends,
Envy's mad tooth is gnashed in vain;
His noble nature treats it with disdain.

It is the pitiful little human touch which shows us that this great man had among his own *confrères* a few spiteful and envious detractors, which caused him in the latter part of the second volume of the second edition to state, that "The rumor having been falsely set about that he has

abandoned the profession—which rumor cannot have been invented otherwise than by those individuals who, sacrificing honor to interest, would attract to themselves the persons who honor the author with their confidence—he therefore finds

bered for the “key” he didn’t invent, carried on against him.

TEACHINGS OF THE FIRST DENTAL TEXT-BOOK.

Let us glance quickly at a very few points in this *first* dental text-book, which held a first place in dental literature for nearly a hundred years.

Of dental anatomy.

In the opening chapter Fauchard speaks of the structure, position, and connection of the teeth; of their origin and growth; he gives an excellent description of the alveoli and the roots of the teeth, and calls attention to some anomalies worthy of note. He describes the pulp-cavity and root-canals, and treats of the nerves, arteries, and veins of the teeth, in a most detailed manner; and after alluding to their general structure he goes on to speak of the microscopical structure of the enamel, following in this the writings of La Hire, published in 1699. He gives a good description of the deciduous teeth, and says that they are not without roots, as some authors pretend; and that under these twenty teeth are to be found the germs of the permanent ones. He tells of the maladies of children at the period of teething, and of the best remedies to apply, and strongly advises the lancing of the gum when necessary.

In three chapters the author speaks of the utility of the teeth; of the rules to be observed for their preservation, and the modes of keeping them white and of strengthening the gums. From a passage in the fifth chapter we learn that tooth-brushes were already in use. Fauchard did not approve of them, but advises the use of small sponges instead.

In closing this part of his work he states that—“The little or no care as to cleanliness of the teeth is ordinarily the cause of all the maladies that destroy them.” In speaking of the value of

FIG. 2.



PIERRE FAUCHARD.

(From the second French edition of his work, 1746.)

it necessary to give warning that he still continues the practice of his art in Paris, in the Rue de la Comédie Française, together with his brother-in-law and sole disciple, M. Duchemin.” Or the verses may refer, indirectly, to the bitter controversy that Croissant de Garengéot, a studious, dull man, who is remem-

thorough mastication he quotes the old French proverb that "The bite long chewed is half cooked and does not irritate the stomach."

Of caries.

As to the decay of the teeth, Fauchard puts aside the old theory of "dental worms," with the following words: "I have done everything possible to convince myself, with my own eyes, of the existence of these worms. I have made use of the excellent microscopes of Manteville, sworn surgeon of Paris, and have made a great number of experiments with them, both on caries in teeth newly extracted, as well as on tartar of different consistence accumulated on the same, but have never succeeded in finding any worms." And he only speaks of the subject in his work because of his respect for the authority—and, as he says, *sincerity*—of some of the writers who held to the theory.

Dental caries, Fauchard says, is produced by a humor that insinuates itself into the midst of the osseous fibers of the teeth, and displacing the particles which compose these fibers gives rise to their destruction. Among the external causes are blows, improper use of the file, application of acids, alteration of the saliva, impressions of heat or cold, and also certain kinds of nourishment.

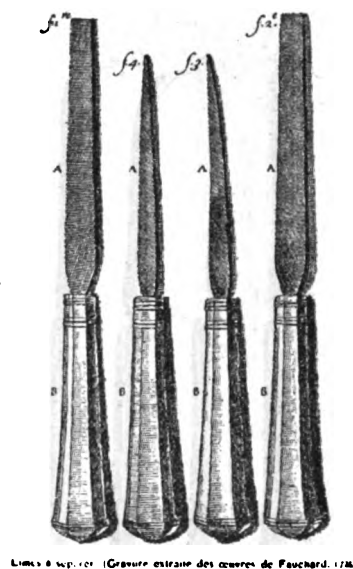
The ideas expressed by Fauchard are not above modern criticism, nevertheless we owe a great deal to him for having, once for all, put an end to the ridiculous theory of dental worms, and for having tried to find a reasonable explanation of the manner in which caries is produced.

Of filling teeth.

As to the treatment: When caries was very superficial he used the file (Fig. 3); when it was deeper he removed the decay, prepared the cavity, and after using oil of cinnamon, of which he was very fond, he filled the tooth. The materials used for this were lead, tin, and gold. "Fine tin," he says, "is preferable to lead, for

lead turns black in the mouth much more easily and is much less durable; both are preferable to gold, because lighter and adapting themselves better to the unevenness of the cavity. Besides, gold being dear, not every one can, or will, make the corresponding outlay."

FIG. 3.



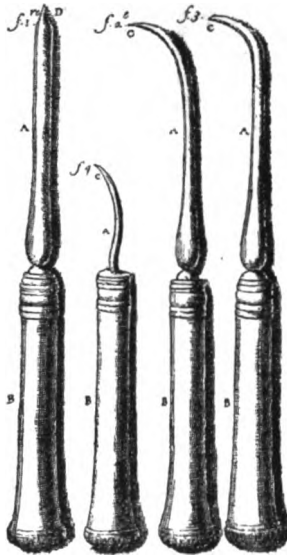
Separating files.

The author here adds that those who—from vanity, or because possessed of the opinion that gold has special virtues—will not have their teeth filled except with it, not unfrequently find dentists who, as the saying goes, content them and cozen them by using leaf tin or lead, colored yellow, making them pay for it as gold! The leaf metals were introduced somewhat after the fashion of soft-gold cylinders, and compressed by means of three kinds of pluggers, which would nowadays be considered insufficient, but which nevertheless served to make excellent fillings. (Fig. 4.) Fauchard speaks of a lead filling which had lasted in perfect condition for forty years.

In writing of the preparation of a carious cavity he makes the following interesting comment: "It is not possible

sometimes to avoid uncovering the nerve with the instruments; one becomes aware of this by the pain caused, and better still by a little blood issuing from the dental vessels." In such cases Fauchard advises "the *immediate* stopping of the tooth, for if it be delayed it is sure to be followed by inflammation and great pain,

FIG. 4.



Rugues et fauchard, d'après Fauchard (1728).

Set of pluggers.

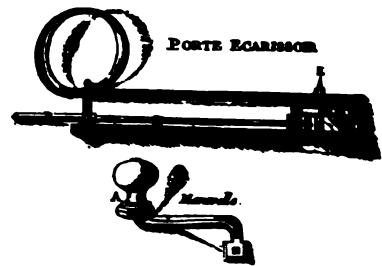
rendering necessary the removal of the lead, or even the extraction of the tooth."

He vigorously criticizes the quacks and empirics of the time who claimed to cure all troubles of the teeth. The cautery was much in use, and he cites an Italian physician who had determined the exact point on the ear which must be touched in order to make the toothache disappear.

As it happens at times that the canal of the tooth is so narrow that it is impossible to penetrate it, he recommends to take a convenient borer mounted in its handle, this to be held in the left hand, and its bow used with the right hand to enlarge the canal. This curious instrument was

destined to be used, in one form or another, for nearly a century, but the germ of our dental engine, a mechanical device for the excavation of cavities of decay by means of a revolving tool, is referred to by Fauchard in the first edition of his work (1728), and was illustrated by Jourdain in his "Nouveaux Éléments d'Odontologie," published in Paris in 1756, and was also described by Bourdet a year later. (Fig. 5.) Fauchard writes of this instrument as follows: "A dentist of this city has made a singular machine, which he proposes to use for

FIG. 5.



The beginning of the dental engine: Jourdain's *Porte Écarissoir*. A, Crank.

separating the teeth. This instrument, upon which is mounted a little bur resembling those which watchmakers use for forming the teeth on the wheels of watches, is said to be very useful, as it may be used on all parts of the teeth wherever we wish to separate the one from the other, and the dentist is able to guide its action so that it will scoop out or cut upon one tooth, or only upon a part, without touching those at its side."

Of extraction.

In that part of his work treating of the extraction of the teeth Fauchard recognizes the difficulty of using the pelican, which he modified advantageously (Figs. 6, 7, and 8), and he illustrates several forms of forceps. (Figs. 9 and 10.) He criticizes the position usually given to the patients operated on—that is, mak-

FIG. 6.

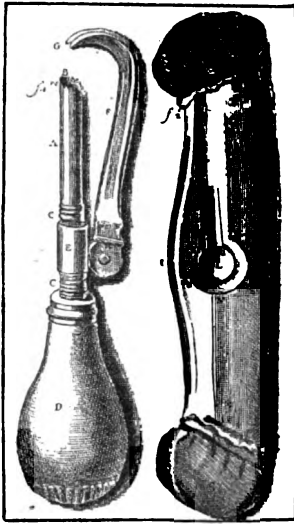
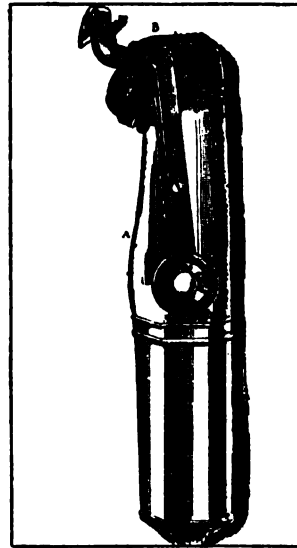


Fig. 1. Levier droit ou urtiroir. Fig. 2. Corps d'un pelican sans ses crochets.
(Gravure extraite des œuvres de Fauchard, 1737.)

1, Straight lever. 2, Body of a pelican without its hooks.

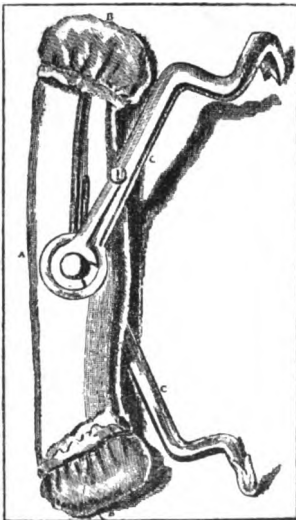
FIG. 7.



Pelican à un seul crochet interchangeable imaginé par Fauchard.
(Gravure extraite de ses œuvres, 1737.)

Interchangeable single-hooked pelican devised by Fauchard.

FIG. 8.

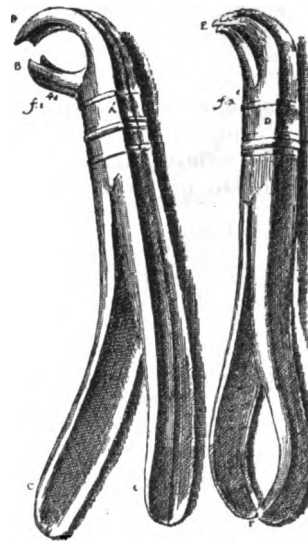


Pelican à deux crochets modifié par Fauchard et dont la demi-roue est garnie d'un cuir. (Gravure extraite des œuvres de Fauchard, 1737.)

Double-hooked pelican modified by Fauchard.

[VOL. XLIX.—91]

FIG. 9.



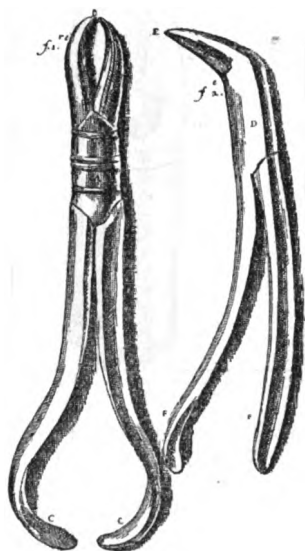
Deviers, d'après Fauchard (1737).

Forceps.

ing them sit on the floor. He did not hesitate to remove the teeth of pregnant or nursing women, with certain reservations.

He speaks of the replanting and transplanting of teeth as quite frequently

FIG. 10.



Davier en place à racine, d'après Fauchard.
(Gravure extraite de son ouvrage, 1727.)

Forceps and root-pincers.

done, and believes that notwithstanding the breaking down of vessels and nerves, there is a complete recovery of the circulation and vitality, and what is more, gives proofs, to his own satisfaction at least.

Of the correction of irregularities of the teeth.

Fauchard has much to say of interest in the chapter in which he treats of the correction of the irregularities of the teeth. He speaks of the necessity of removing the deciduous teeth in time, so as to avoid the deviation of the permanent set. He made use of the most simple means—the file, pressure with the fingers, common or silk threads, and little plates of silver and gold com-

bined with metal wires and silk ligatures. At times he made use of the pelican and straight forceps to forcibly move the teeth, afterward tying them in the normal position, stating that he used this quick method, in cases of persons thirty or forty years of age, with success, and believed it to be original with him. *He rarely had recourse to extraction as a means of carrying out dental corrections.* (Vol. ii, p. 87.) Dr. Angle says that "The first appliance which was destined to make a distinct step in the written history of orthodontia was that given us

FIG. 11.

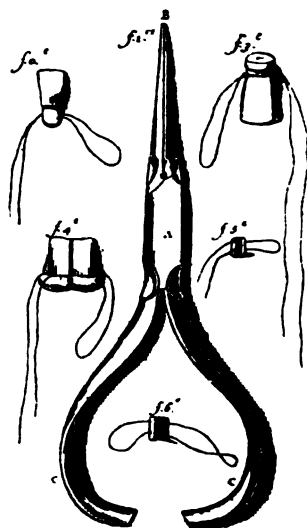


Fig. 1, pince à ligature. — Fig. 3, 4, dents artificielles en hippopotame. — Fig. 5, 6, blocs en ivoire pour maintenir l'écartement des dents. (Gravure extraite des œuvres de Fauchard, 1727.)

- 1, Ligature pliers. 3, 4, Artificial teeth in hippopotamus ivory. 5, 6, Ivory blocks for separating.

by Fauchard in 1728—the expansion arch. Unquestionably the conception of this device was the one greatest step in the invention of appliances."

Fauchard is the first to give clearly and at length an account of the prosthetic appliances of his epoch. (See Figs. 11–14.) The materials employed were human teeth, hippopotamus ivory, the teeth and leg bones of the ox, etc.

He does not seem to have known of the plaster impressions of Purmann of Breslau (1700), or of the wax impressions referred to by Pfaff (1756), and measurements were probably taken with the compass, and paper models, cut with scissors, were used. The dentures were held in position with gold wires, steel and whalebone springs, which he was probably the first to use. But it is of more

FIG. 12.

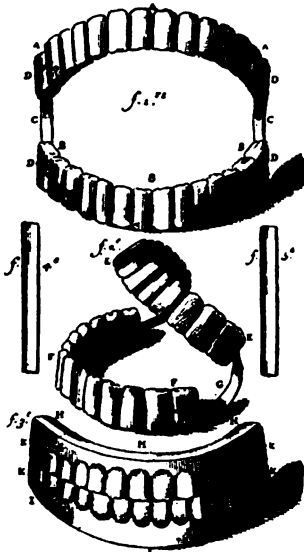


Fig. 1, 2, 3, dentier complet. — Fig. 4, 5, ressorts en acier. (Gravure d'après Fauchard.)

Complete denture with steel springs.

interest to note that in 1746 (vol. ii, p. 352) he mentions the application of the suction principle for the retention of upper sets—an idea usually ascribed to James Gardette more than half a century later. He also gives a long and minute account of the so-called "pivot" tooth with, first, the *metal* dowel, which we must remember was given up, for many years, for the wooden one.

As to obturators, Fauchard describes and illustrates more complicated mechanism for the purpose than anyone that preceded him, nevertheless the principle of support was much the same as that

FIG. 13.

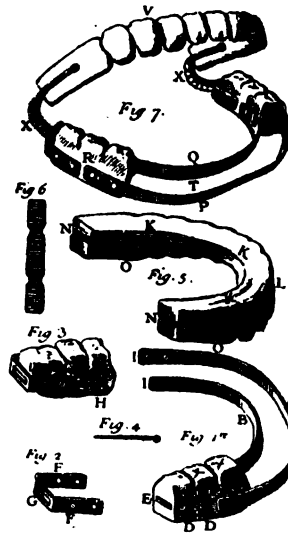
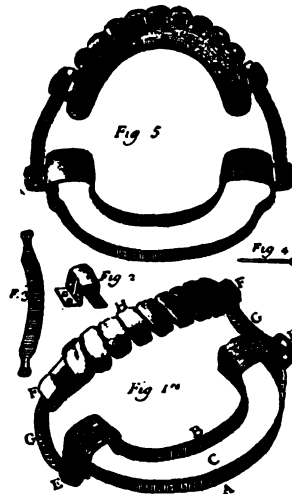


Fig. 7, dentier à ressort permettant la présence des dents antérieures du bas. Fig. 1, 2, 3, 4, 5, les différentes pièces qui composent le dentier (Gravure d'après Fauchard.)

Denture with springs; full upper and partial lower.

FIG. 14.

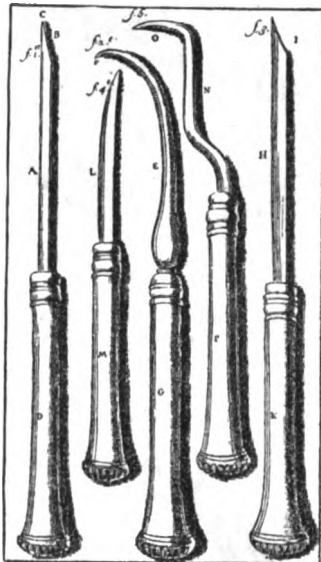


Armature métallique fixée sur les dents du bas, permettant l'adaptation des ressorts pour maintenir le haut. (Gravure d'après Fauchard.)

Metallic fixture adjusted on lower teeth for adaptation of springs to hold upper denture in place.

of his predecessors. As he seems to have been the first to construct such formidable apparatus, the ingenuity which he displayed in their contrivance entitles him to much credit. Dr. John H. Meyer of New York, in the *Cosmos* for September 1906, has an account of a successful plate-obturator, embodying a principle for which he gives proper credit to Paré (1541) and Fauchard (1728).

FIG. 15.



Instruments à nettoyer d'après Fauchard (1727)

Instruments for cleaning.

Fauchard was the first to really describe a scorbutic affection called by the older writers "conjoined suppuration of the alveoli and gums," and as his remarks, says Jourdain, evince consummate experience, it has been called "Fauchard's disease"—*la maladie de Fauchard*. He argued that it had a local rather than a constitutional cause, and believed that the only radical cure was extraction.

THE FIELD COVERED BY FAUCHARD'S WORK.

"A careful reading of the list of subjects treated in Fauchard's work," says

Dr. Trueman, "will show how fully and systematically he covered the whole ground of dental science, and refutes the common idea that dentistry in his day consisted in tooth-pulling and tooth-replacing. In my judgment, as an original and comprehensive exponent of dental science it had no rival in the English tongue until Chapin A. Harris' 'Principles and Practice' had reached its second or third edition."

After a long and honorable career, this illustrious professional ancestor of ours died at his residence in the Rue des Grands Cordeliers on the 25th day of March, 1759 (March 22, 1761; May 22, 1761—the exact date has been a matter of dispute).

Dr. Viau says, "Unfortunately for us he had no pupils," but we have a most interesting and artistic card of one who claimed to be his successor in practice—De la Fondée.

CHAPIN A. HARRIS ON FAUCHARD.

In closing, one cannot do better than quote the eloquent words of Chapin A. Harris:

"He found the dental art a crude branch of mechanics; he left it a digested and systematic branch of the curative art. Though his own practice was far inferior in excellence to that of our day; though his instruments were rude, and the many appliances of his art very deficient in completeness and nicety of adaptation, yet, considering the circumstances under which he lived, Fauchard deserves to be affectionately remembered as a noble pioneer and sure founder of dental science. That his practice was crude was due to his times; that it was scientific and comparatively superior and successful was due to himself."

He was an inspiration and example to his countrymen and should be so to all dentists, and I wish to place myself again on record, as I did at Atlanta last summer, as sincerely believing that the day will come when some public recognition of the obligation we are under to

this great Frenchman will be made, and that a statue of him will be erected in the city of Paris by the grateful contributions of the dentists of America.

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A SYSTEM OF CROWNING AND BRIDGING BY THE AID OF A NEW CROWN.

By HARRISON D. BEST, D.D.S., Pittsburg, Pa.

(Clinic at the thirty-ninth annual meeting of the Pennsylvania State Dental Society, Pittsburg, July 9, 1907.)

THE subject I am to discuss has to do with one of the most important as well as most difficult problems of dentistry—the crowning and bridging of teeth. Without attempting to do full justice to so great a theme I will confine myself to the description of some new methods made possible by the introduction of a crown never before used, so far as I am aware. This crown I hope and anticipate will be manufactured in two forms, with a pin baked in the porcelain and with a removable pin. We shall thus have practically two more stock crowns, and I believe their use will afford a great many advantages over older methods in crowning, treating, and banding roots,

and in providing a very flexible and widely adaptable system of bridge making.

DESCRIPTION OF THE CROWN.

The body of the crown is composed of porcelain. In the pin (Fig. 1) lies the special peculiarity. This consists of a metal tube, slightly bent, passing through the body of the crown and ending flush with the lingual or masticating surface. (Figs. 2 and 3.) There is thus a distinct opening through the crown and pin. The tube is cylindrical, its outside diameter is of No. 11 gage, and its inside diameter No. 16 gage. It has a shoulder in the

form of a ring which meets and is partially embedded in the porcelain. The tube thus formed constitutes the pin for the attachment of the crown and may be baked or cemented in the latter.

SETTING OF THE CROWN.

The crown is set much as are other pin crowns. Though the hollow pin is not pointed, adaptation is better, since there is a free exit for the excess of cement and for air through the hollow pin. This feature eliminates the danger of forcing cement through the apical foramen, thus removing a prolific source of periapical inflammation. The cement may be worked stiffer in setting this kind of crown, which possibility some operators may consider an advantage. When the tube is to remain open, to receive the cap backing presently to be described, or for the purpose of treatment, the cement in the tube may be removed at once, or may be drilled out when hard.

THE "CAP BACKING."

On account of the hollow pin, the crown permits the use of a metallic backing, which may be termed a "cap backing" to distinguish it from the ordinary form. (Figs. 4 and 5.) The cap backing is made as follows:

A piece of pure gold, No. 34 or 36 gage, is burnished over the distal surface of the crown, and perforated to receive through it a solid pin of No. 16 gage, which is inserted into the hollow pin to the desired distance. The backing is trimmed to the general contour of the crown, and together with the pin is removed, and the distal surface of the crown and tube is thoroughly coated with whiting or chalk. The backing and pin are now pressed firmly into place on the crown and the whole is invested, rather heavily, in a good non-shrinking compound, and soldered. After breaking away the investment the completed cap backing (a backing with a pin attached) will come away from the crown quite easily.

In setting the cap backing it may be

made removable at will by using gutta-percha. When a stationary cap backing is required, the coating of the crown with whiting is omitted, and in this case the two will be found to adhere very firmly.

BANDING.

If it be desired to band a root, the hollow loose-pin crown lends itself admirably for that purpose. The root is trimmed and the band is made in the usual way. To make the floor, pure gold of No. 34 gage is used. It is very easily formed by first obtaining a well-defined impression by pressing the crown with its tube into modeling composition and then shaping the gold by using the crown as the die and the impression as the counter-die. The gold is trimmed, so as to leave a slight overlapping edge around the crown. On pressing it into place on the band, which has been placed on the root, the adaptation will be found quite perfect. The whole is then taken from the mouth, the porcelain body removed from the tube, and the band, floor, and tube are soldered into one solid piece over a Bunsen flame.

ADVANTAGES OF THE CROWN.

Having described the hollow pin crown, its setting and capping, and the method of banding, let us briefly describe some of the advantages it seems to offer. We will at present consider its use only in simple crowning.

(1) *In cases of diseased roots.* It is obvious to all that we can set this crown when the case first presents itself and thereafter treat the root in the usual manner. The patient is pleased to have a crown at once instead of an unsightly vacancy for an indefinite period. Treatment is more likely to be thorough, as time is not an important element, and hence there should be fewer cases of recurrence. Finally, after the crown is permanently set, it will still be an easy matter to reach the root should trouble arise, by simply drilling out the cement in the tube. The metal wall of the tube guides the drill, and the cement is easily

removed, while at the same time the danger of drilling through the side of the root is eliminated.

(2) *Strength.* The hollow pin crown has the esthetic advantages of a porcelain crown and the technical advantages of a metal-backed crown without being deficient in strength. In fact, by this method we can make a crown stronger than any now in use.

set with gutta-percha. If the crown has been merely chipped it may be repaired with gold, by attaching it to the cap backing.

(4) *Use in banding.* The advisability of banding roots is a much-discussed question. Certainly many roots will continue to be banded, and this crown offers a rapid and easy method of doing it. With the smaller roots the tube may be

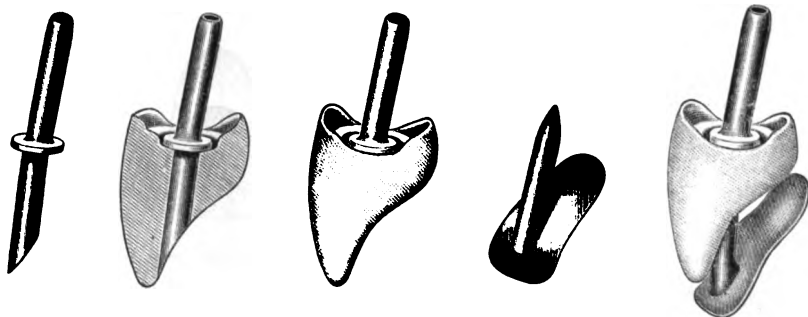
FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.



By the aid of the cap backing with its telescoping pin we have a very effectual means of adding extra strength to the crown—as, for instance, in the case of a small lateral tooth or where a tooth is so situated as to have unusual stress thrown upon it. It further provides a metallic surface by which attachments may be made to a similar surface, the strain being thereby evenly distributed. (The making of bridges is not here referred to, as that phase of the subject will be taken up later.)

(3) *Ease and thoroughness of repair.* While it is thought that the crown under consideration is as strong, and can be made stronger, than others, nevertheless accidents will occur; and should a crown break its repair is a very simple matter. It will not be necessary to drill out the pin. After removing the broken body of porcelain, a duplicate crown with loose pin may quickly be fitted and cemented to place. If the cap backing has been used with the crown, it may be removed by heating, as it should be invariably

cut quite short, tapered slightly, and the inner pin cut longer and tapered, thus giving good anchorage with little sacrifice of root-substance. The inner pin, of course, is part of the cap backing, and should be used in these cases.

(5) *Adaptability.* Should it be manufactured, it would be no small advantage, besides the special features above enumerated, to have such a stock crown made in two forms from the same molds—that is, with the pin baked in the porcelain and with removable pin. It would seem that this crown could replace with profit many of the hand-made crowns now in use. The cap backing with its inner pin should always be used with small or weak roots.

BRIDGING OF TEETH.

Turning now to the remaining portion of the subject, we will take up the construction of bridges by the aid of the hollow pin crown. You will no doubt have observed that the metallic cap back-

ing furnishes the starting-point for bridge work. This with the other possibilities of the crown as pointed out allows of a great variety of results.

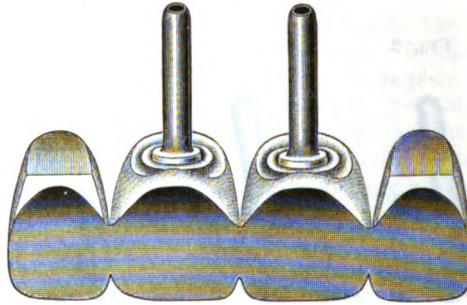
The different kinds of bridges that may be constructed by this method are best divided into three types—permanent,

These will now be pointed out, at least as far as they are considered essential.

First, when it comes to articulating the crowns, allowance must be made for the cap backings later to be applied.

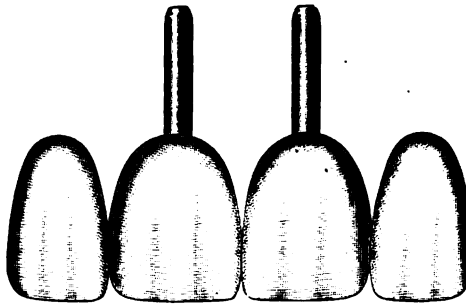
Secondly, in making the cast, a good non-shrinking investment compound

FIG. 6.



Ordinary backings with facings, and abutments with cap backings.

FIG. 7.



Stationary bridge.

removable, and mixed. The first is the simplest, and when set is like the ordinary type of bridge in not being removable. The second form introduces a new feature, in that everything but the porcelain crowns is removable at will. Bridges of the third group involve simply the addition of any other crown or metallic work to either of the preceding forms.

The methods of work do not differ much from those now employed, but of course certain variations are necessary.

must be used, owing to the fact that the bridge remains on the cast during the soldering.

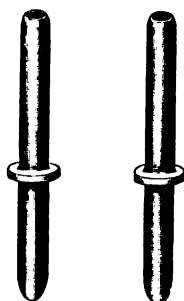
Thirdly, the crowns must be fitted with cap backings as previously described (Fig. 6), except that the soldering is not done until the whole bridge is ready. When thus soldered, the ordinary backing with the facings, becomes continuous with the cap backings with their pins, while the latter are firmly united to the hollow pin crowns. The bridge is now soldered

in the usual manner. The result will be, when set, a permanent bridge with porcelain abutments. (Fig. 7.)

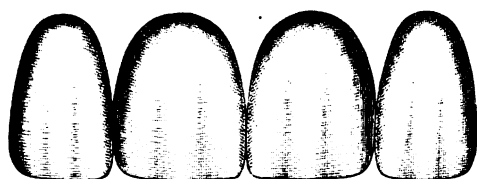
If, however, certain conditions are ob-

ing, as described in the first part of this paper; and second, by preventing the flowing of the solder across the interproximal spaces of the crowns and fa-

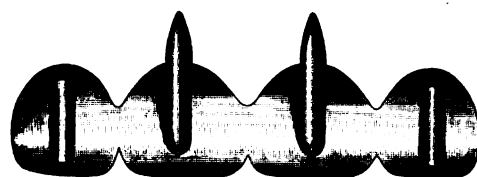
FIG. 8.



a

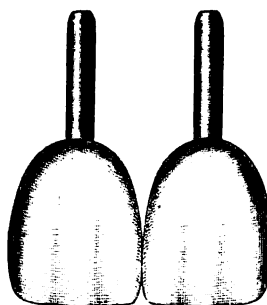


b

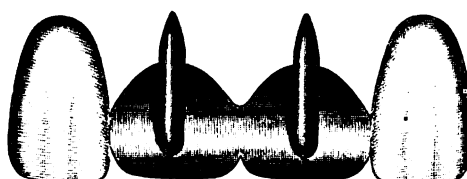


c

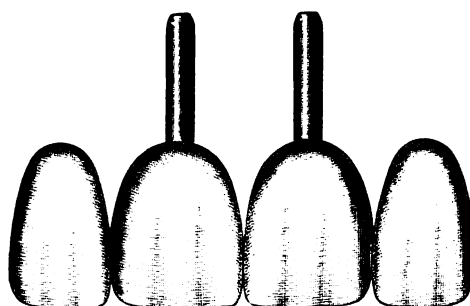
FIG. 9.



a



b



c

FIG. 8: Parts of removable bridge. a, Hollow posts. b, Ordinary facings and special crowns. c, Continuous backing.

FIG. 9: Assembling of removable parts. a, Special crowns with hollow posts. b, Ordinary facings and backings, and cap backings with pins. c, Completed bridge.

served, the second or removable type of bridge is obtained. (Figs. 8 and 9.) This is formed by, first, preventing adhesion of the cap backings when solder-

ings, as otherwise it would not only constitute an esthetic fault, but in addition would form wedges, preventing the withdrawal of the bridge. It will be observed

that while this style of bridge has been termed "removable," it is not so, strictly speaking, since only the backing (cap backings with pins and ordinary backing with facings) can be withdrawn from the crowns. Bridges thus made may be so accurately fitted that no cement at all would be necessary to hold them in place during the time needed to treat diseased roots.

The third group of bridges, the mixed, involves no new principles. It is added for the sake of completeness and to show that this system of bridge construction may be used in combination with any of the metallic or metallic backed crowns now in use. It may further be noted that bands may be readily used with the hollow loose-pin crown. It is even possible to make a completely removable and separable bridge by using loose-pin banded crowns, removable facings, and gutta-percha. Whether this be advisable, in order to secure unexcelled ease in repairing, may be left to future consideration.

ADVANTAGES OF THE HOLLOW-PIN CROWN IN BRIDGE WORK.

(1) It need scarcely be pointed out that the possibility of having to treat diseased roots holds in bridge work as in the case of simple crowns.

(2) Repair is easy and the bridge need not be mutilated in the process.

(3) It would be no small item to have at hand a stock crown suitable not only for crowning, but also for constructing bridges when other than those of the gold crown type are desired.

(4) Articulation in this system is simplified and therefore made easier.

(5) It follows from the two preceding statements that the best results may be obtained, and that, too, with a minimum amount of labor and a maximum degree of certainty.

(6) In this type of bridge the porcelain body offers esthetic advantages without any sacrifice of strength, a feature of greater value here than in crown work.

(7) There is an additional advantage in being able to use a stock crown with which to construct so many varieties of this type of bridge work, and which may also be used with any other system now in use.

Thus as briefly as possible I have tried to present the uses and advantages of the hollow pin crown. It has been thought out and worked out in the course of several years, and much of it has been practically tested. There are many details of the work which have not been touched upon. Without doubt, when other minds take up this system great advances in the work will be made. It is presented to the dental profession in the hope of adding a valuable help in a difficult field.

CROWNS WITHOUT SOLDER, BRIDGES WITH AND WITHOUT SOLDER, AND A TALK ON CROWN AND BRIDGE WORK.

By ALBERT W. JARMAN, D.D.S., Philadelphia, Pa.

THE practice of dentistry undergoes many changes from time to time, as its history shows. Dentists acquire many hobbies, some of which last and become established methods of practice, while others fail when subjected to the test of durability. That the use of 24-k. gold inlays, as demonstrated by Dr. Taggart of Chicago, will become general cannot be doubted. These inlays fit the cavity closely, and having the durable and adaptable edge of pure gold carried out to the most minute feather-edge, leave no possibility of doubt as to the exactness of their manufacture and adaptation to the margin of the cavity.

The process of casting gold can be utilized in other ways and in other branches of dentistry. Its application in crown and bridge work is almost unlimited. The writer does not claim priority regarding its application to crown and bridge work, but believes that its introduction in this branch of prosthetic dentistry will tend to revolutionize all the old methods of making crowns and bridges, for the reason that while by the casting method they will be made as perfectly as heretofore, they will, however, be made after a more scientific method and of the same grade of gold throughout, thus lessening the need of solder. Crowns and bridges thus made restore the articulation perfectly, give any desired contour to the crowns, and leave a clean surface which can be finished with less pits and without any difference in color. A description of its application to this important branch of dentistry will perhaps be of interest to some readers, and in addition, by making investigation more general and by enlisting the experience of the many prosthetic

practitioners, its use will, without doubt, become more generalized.

The Taggart apparatus and the Custer electric casting appliance will be found very convenient for this work, although good results can be obtained by many appliances which are on the market, involving the casting principle. Dr. Taggart's apparatus requires nitrous oxid and gas for the source of heat and pressure; Dr. Custer uses the electric arc light for melting the metal, while by some casting methods the flame of an ordinary blowpipe is sufficient. The use of a casting appliance does away with all die plates, buttons, fusible metal cusps, and in fact with all cusp systems and swaging appliances now in use. Pure gold matrices to be filled with coin gold or 22-k. plate are no longer needed, since the pure gold was used only as a matrix and was polished off when finishing the cusp portion of the crown.

Of course this system will not appeal to those who desire to make bridges and crowns by a swaging method from gold disks or other forms which are filled with a small quantity of solder in the cusp portion of the crowns, using as little material as possible in order to obtain a large profit at a small fee. Inasmuch as by the casting system the piece is made more solid, stiff, and durable—thus using more gold than ever before—it will certainly appeal only to those who are imbued with high ideals and a desire to produce a superior grade of crowns and bridges. We can make, by the method under discussion, crowns with cusps that will articulate perfectly, for they can be finished as thick as desired by first carving the crown in wax as it is to be after its casting in gold.

Any desired variety of gold can be used for casting; clasp metal can be employed when necessary. Many a crown-and-bridge worker is partial to coin gold—since it has a richness of color when properly polished, and owing to the copper it contains it gives great durability and stiffness to the finished piece. Other practitioners prefer 22-k. gold. As this system applies to any form of gold, that to be used will depend on the choice of the dentist. As coin gold, however, is best suited for removable bridge work, this paper will refer to it almost exclusively as the material *par excellence* for all crowns and bridges, fixed or removable.

It might be well at first to say a few words descriptive of the casting appliances and their parts, but to avoid detail I will intermingle the description as much as possible with the subject-matter of the article. We will deal first with a shell crown, either a molar or bicuspid. First in order is the fitting of the band to the prepared root.

MOLAR OR BICUSPID SHELL CROWN BY THE CASTING PROCESS.

As the subject of root-preparation is a lengthy one and rather remote from our subject, I will avoid detail at this time. The root having been prepared in the manner recognized by bridge workers—all undercuts having been removed—a sweated band of coin gold should be adjusted so as to fit the root properly and to extend slightly beneath the gum margin. Having fitted the band to the root, shape the sides of the band to the general contour of the tooth. Restore as much of the contour, by shaping the sides of the band, as the fulness of the latter will permit. Further contour can be obtained prior to the casting by adding wax and carving it to the desired shape. We may now take an impression of the teeth with the band in position, a satisfactory method consisting in placing plaster on top of the band and adjoining teeth, and then directing the patient to close the mouth, thus obtaining an accurate impression of the adjoining teeth, the occluding

teeth, and an accurate bite. From this impression plaster casts are prepared, articulated to each other, or, if preferred, articulated by means of a crown articulator. The casts will give a correct representation of the band when in the mouth. S. S. White base-plate paraffin and wax, or any form of paraffin wax which can be carved, is now softened sufficiently to make it moldable, and is pressed into the band in order to form the masticating surface of the crown. Should you prefer it the wax may be placed in the band while on the root, and the patient directed to close the mouth, after which the band may be removed with the wax in place, which will then be ready for carving. Any work that can be done outside of the mouth, namely, on the casts, is preferable to both patient and operator. If the work be done on articulated casts, the wax is placed in the band and the articulation closed, in order to secure an accurate impression of the occluding teeth in the wax. The fissures and cusps are carved in the wax, but care should be taken not to disturb the articulation.

The piece having been prepared after the manner above described, it is now ready for the flasking. First, we introduce the sprue (Fig. 1) into the wax cusp, at some point where the crown may be easily finished. (Fig. 2.) Then remove the band and wax cusp from the cast, being careful not to disturb the relationship of the wax to the band. It is now invested in a fine investing material. (Dr. A. E. Peck's porcelain inlay investment compound being a useful one for this purpose.) Invest the case in the flask (Fig. 3); allow the investment to harden sufficiently, and remove the sprue by heating and withdrawing it from the investment. This leaves an open gate to the crown. Invert the flask containing the invested crown, and place it over the slow fire of a small gas stove. The size of the flame is increased as the investment dries, and when heated to redness carry it to the casting device, and place a large nugget of gold, of the same kind as the band, in the carbon crucible, or, if the carbon crucible is not used,

over the entrance to the gate of the flask containing the invested case. This nugget of gold is now heated until it is in the spluttering state—a state beyond melting. When this occurs turn on the air or nitrous oxid pressure, whichever be the one used. The Custer apparatus will require forty pounds air-pressure. The pressure will force the metal down into the flask and reproduce in metal the form as carved in wax, and the cast

With the apparatus now on the market, it becomes necessary to make the castings for bridge work in sections which can easily be joined by the use of a high-karat solder. Small bridges can be cast in a single casting and without the facings, unless the detachable facing be used. In large cases the casting method must be limited to the making of the gold portion of the bridge in sections. It is indicated especially in cases where the

FIG. 1.



FIG. 2.

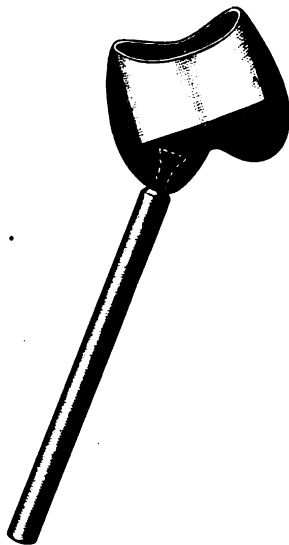
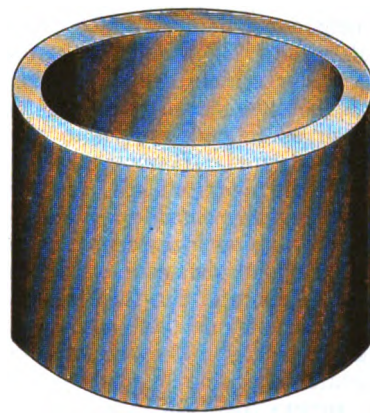


FIG. 3.



metal will be firmly united with the band. The cast crown is removed from the flask and treated with hydrofluoric acid, so as to dissolve any minute particles of the investment material that might remain attached to the gold. The crown is now ready for disk and polishing on the lathe.

BRIDGE WORK BY THE CASTING PROCESS.

Bridges are made in a manner similar to the method described for crowns. As the size of the sprue hole is necessarily small and cannot be increased, we are limited to the size of casting that may be made through a single sprue or gate.

saddle is used, and the lingual as well as the buccal surfaces of the bridge are to be of the proper contour. Self-cleansing bridges—bridges without porcelain facings and with open spaces—can easily be made by this system, but in the case of a long self-cleansing bridge it will be necessary to make it in two sections, and to join them with a high-karat solder.

Operative dentistry not having as yet reached the stage where all teeth can be saved, we are every day brought face to face with conditions which require the best prosthetic ability to restore lost teeth by substitutes which will fill the spaces in the upper or lower dentures, and by substitutes I mean those which

will imitate the lost organs in form, size, and functional usefulness. The ideal way to supply teeth in case of partial loss is by means of high grade crown and bridge work; crowns that will articulate, and bridges that will be cleanly and resist the stress of mastication.

WANTED!—A MECHANICAL SENSE.

In the August issue of the *Cosmos* is a paper by Dr. James Truman entitled "Wanted!—A Pathological Sense." I might say, and I think many will agree with me, that a paper could also be written having for title "Wanted!—A Mechanical Sense," judging from the many bridges made which are mechanically wrong. In these cases the leverage is often such as to cause opposite results from those desired. How many bridges are made for the front of the mouth, without previously considering the need of restoring missing bicuspid or molars!

The molars and bicuspid are the teeth adapted to withstand the force of mastication. The anterior teeth are for cutting purposes only. The articulation of the molars and the bicuspid, when normal, retains the teeth in position, and when abnormal, holds them out of position.

An excellent method of procedure for crown and bridge work is to study first the articulated casts. Take the articulated casts of the upper and lower jaws as a case presents itself, and study them with the same thoroughness as a practitioner of orthodontia would, but with a "prosthetic sense." First, consider the replacement of lost molars and bicuspid, so as to relieve the strain upon the anterior teeth, and when the restoration of the masticating surfaces in the back of the mouth is completed, it will be time to place bridges or crowns, if necessary, in the front of the mouth.

It is not necessary to take any plaster impression for the study casts, as modeling compound impression will produce casts which will show the length of bite and general form of the teeth and mouth. If after a study of the articulated casts it is decided that crown and bridge work is necessary, it should be made of the highest grade possible, and, for hygienic reasons, the removable bridge work should be preferred; also because it can be more easily repaired in case of accident. The saddle can be used in most cases of removable bridge work, as it affords opportunity for the entire restoration of the lingual and buccal sides, leaving no hollow spaces or openwork beneath the bridge to annoy the tongue. The base of the saddles should be made of soft platinum reinforced with coin gold, in order to have a pure platinum surface next to the gum.

The saddle should be so adjusted as to be in perfect relation with the removable portion of the bridge to which it is joined, and should fit tightly to the gum. Its size must depend on the nature of the muscular attachment on the lingual and buccal sides. The higher the alveolar ridge, the more useful is the saddle. Its adjustment to the gum should be such that it will not bear upon the top of the ridge as much as upon either side.

The molar and bicuspid crowns with removable pins, as supplied by the dental supply houses, will be found very useful in saddle work where a porcelain masticating surface as well as a buccal surface of porcelain is desired. They will be found very useful in lower bridges, as they minimize display of gold.

As the lower teeth are sometimes exposed to view during laughter, on account of the mouth being opened widely, any method that will give a porcelain masticating surface to lower bridges is worth consideration.

RECREATIONS FOR THE DENTIST, WITH SOME BASIC REQUIREMENTS.

By ALLAN GORDON BENNETT, D.D.S., Minneapolis, Minn.

AN article in the July *Cosmos*, by Dr. B. Holly Smith, has reminded me once more of a subject that has been not only too little discussed but too long neglected, with the inevitable result that much good ability has been crippled and not a few valuable lives sacrificed. Many of the points made by Dr. Smith are so much in evidence that it is surprising that the whole subject receives so little attention. There is no doubt that the dentists are the hardest-worked men in the whole circle of the professions; that the conditions under which they operate are the most exacting and, generally speaking, the most exhausting; that the time devoted to operations at the chair is more monotonous and longer than that of any other specialist; that such is the nature of most dental operations for preserving the teeth that each must be performed in the best possible manner; and finally, in the words of Dr. Smith, the dentist, unlike the general practitioner of medicine, is not always "made to feel that he and God are the great dispensers of healing and comfort."

It is true that there is more than one feature of dentistry that, aside from the fear and pain suffered by the patient, has not a little uplift on the operator himself. Dr. Smith says truly and aptly that "The evolution of graceful and natural forms under the manipulation of our fingers, and the restoration to normal type of marred and faulty conditions in the oral cavity, are more than interesting. The joy of recreation is a great and lasting joy, and it is in a measure a great source of stimulus and inspiration in the average day's work." But alas! the joy is too often sadly marred by the nervous condition of the patient, as our

author intimates, and also by the inability of the operator to do himself full justice, by reason of this and his own depressed spirits and exhausted physical condition.

Besides all this and many other points too obvious to mention, a dentist's years of active life are generally too few for any to be wasted by depression of illness, or any and all kinds and degrees of disability. He owes it to himself, as well as to his patients, to order his life in such a way that, barring the slight changes caused by weather, climate, or other environing factors, he will always be at his best, and in the end will meet the requirements of this exacting commercial age by finding the fullest compensation for all his endeavors; and since fatigue must come toward the end of crowded days, it is a most excellent plan—as Dr. Smith suggests and as I have always endeavored to carry out when possible—to arrange the long, difficult, delicate operations for the earlier part of the day.

BENEFIT FROM DAILY OR WEEKLY OUTINGS.

What the dentist most needs and needs all his life is not an occasional vacation of even a month or two, but a constant vacation at the end of every week, if not at the end of every day, and as I will show later, a positive recreation every morning. According to my own experience it is more beneficial to take half or even a whole holiday each week than a whole season at one time. The two great evils of our civilization are too much of the artificial in place of the natural, and too much sedentary, indoor life, with too little active outdoor life.

I am much pleased with Dr. Smith's sentiment or suggestion as to making friends with the friendly forest, with many visits there and not a little basking under their leafy shade in summer; but I for one would not place the emphasis on even intelligent study, but rather on active rambling and unpremeditated enjoyment; for in this way one can best absorb some part of the forest's mysterious life, vigor, and stimulating beauty.

I must take time and space to indorse strongly Dr. Smith's quotations from the versatile and poetic Van Dyke, as well as the beautiful stanza from Whittier. Not only we as a profession, but we as a people, are too much occupied with the material, the commercial, and the prosaic, not only in the daily struggle, but in hours of leisure which should be devoted largely to living, thinking, and enjoying all that makes for the beautiful and spiritual. It pleases me to think of the mind, not as a primitive dwelling with two or three rooms meanly furnished and merely for existing, but as an artistically constructed residence amply furnished with all that gives fullness and beauty to life.

But my purpose is to give basic principles and methods that can be used not only weekly but daily; not only in one or two seasons, but constantly throughout life. Too much cannot be said for outdoor sports with their pleasures that are so stimulating and invigorating; but they are not sufficiently accessible or convenient or even attractive to meet the daily or even weekly needs of the busy dentist. It cannot be too strongly emphasized that daily exhaustion demands almost daily renewal. Besides this every dentist, even more than other members of the healing fraternity, should embody or exemplify a good physical education, including not only such strength and skill as will be highly beneficial to himself, but he should exemplify such results in caring for the body as will most favorably impress others.

There is yet another argument that applies especially to the dentist. It is claimed that the most distinctive characteristic of the American face is its

narrowness. This, of course, means a narrow jaw and the resultant crowding of the teeth. I will make the claim that an equally distinctive American characteristic is narrow shoulders, and this, of course, means small lungs and weak breathing power, with the implied slow circulation and gradually accumulating waste products which cripple or wreck many a life before fifty, forty, or even thirty. In a word, I consider the expansion of narrow shoulders just as important as the expansion of narrow arches, and much more fundamental; and if I cannot demonstrate by my own experience the elevation of drooping shoulders and expansion of narrow ones—"made easy by the positive system"—if I cannot do this, I am free to admit that I have spent many pleasant years in physical training to little or no purpose. But, on the other hand, if a man at sixty-two is stronger and can stand much longer office hours and at the same time enjoys outdoor sport more keenly and indoor life among his books more intensely, there must be some reason or reasons beyond the mere flight of time or passive existence to account for such a desirable state of things. If I did not write from most satisfactory personal experience I should not write at all.

And lastly, as to arguments, I will say that a dentist, or any other member of the healing art who persistently develops physical vigor, will find a most enjoyable and beneficial accession of mental activity, and such a degree of cheerfulness, as will greatly redound to his own comfort and the happiness of others.

THE DENTIST'S NEED OF DAILY PHYSICAL EXERCISE.

To sum up briefly, then, we have found that of all specialists the busy dentist labors under the greatest daily strain, having the longest hours and generally the least compensation, and is therefore most in need of daily renewal by means that are accessible, economic, convenient, and as highly beneficial as possible. As to the actual value of physical training, the most vital point—and one not yet

fully recognized—is that one's persistence and growth in vigor depend more on one's inherent or acquired interest and enjoyment of such things than on the theoretical or practical benefits one may have in mind or expect to realize at a later day.

It is an old saying as well as a fundamental truth that "Eternal vigilance is the price of liberty." It requires but a moment's reflection to be convinced that eternal vigilance is not only the price of liberty, but the fixed or regular rate of everything that has real value in life as we know it, including not only the larger factors and genuine blessings of civilization in general, but knowledge, justice, reputation, character, health, and life itself, in particular. Training, discipline, and development have always been too partial and fragmentary; but now there is a movement, or at least a tendency not as yet too prominent, to begin at the beginning, and base all acquirements on a solid physical education. Such an education in its widest sense should begin with life and end at death. The highest ideal that can be realized; the broadest standard that is at once rational and practical, finds expression in the phrase "Fulness of Life," physical, mental, moral, and religious. And in order that such fulness may be realized and enjoyed in any satisfying degree, its foundation in physical education must always be kept secure.

In regard to physical development, it may be said briefly that health, vigor, and longevity depend not on stature or length of limb, but on the size and length of the body, and in particular on the breadth of the shoulders and depth of the chest, these dimensions implying the needed size and freedom of movement for the inclosed vital organs. Perhaps the most striking example of this style of physical architecture was the great Napoleon, who, though a very short man, had marvelous powers of application and endurance. A mere glance at his physique reveals at once the basis of these qualities—the large head, thick neck, and the deep chest that usually belong to much larger men, and which are always

the essential basis of all hard, persistent, and long-continued exertion, mental, physical, or both. Personally and by achievements Napoleon was "the man without a model and without a shadow," but physically he furnishes a high standard for our purpose.

Nor can I forbear to mention the very modern up-to-date living—very living—example of physical vigor, mental activity, and personal and most diversified efficiency. It can be justly claimed that the whole civilized world admires Roosevelt's skill as a horseman, his success as a hunter, and, in particular, his love of sport, not to mention his honesty of purpose and his persistent endeavor to establish higher ideals and juster standards in politics and in industrial affairs. But the main point for our present purpose is the large returns this man is realizing from well-invested energy in physical development.

Now, in the matter of body-building we must not only begin at the beginning, but must preserve a proper balance. Mere muscle building, except as a means to an end, is more liable to shorten life than to lengthen it, by weakening the very organs on which life depends. In the order of conscious life, next to the brain motor, the first essential is the normal flowing of the vital current, which is, of course, equally dependent on heart and lungs. But as regards energizing these two vital organs, they can be better contrasted than compared. All that the heart requires, generally speaking, is the normal supply of pure blood and freedom from pressure. Besides the vital nature of their action, which is but one step less automatic than the heart rhythm, the lungs are of all the vital organs the most amenable to improvement, both as to size and in particular as to strength. And the inactive, indoor life of civilization has so weakened these organs as to make their energizing the first essential. This might be termed a happy meeting of unfortunate conditions and of fortunate possibilities that are at once imperative and attainable. This increased size and strength of the lungs of course reacts

powerfully on the circulation of the blood and the consequent renewal of all the tissues.

PHYSICAL EDUCATION AND THE "WHITE PLAGUE."

If, then, physical education is to be begun at the beginning—in the parts most weakened by disuse and most exposed to disease—the lungs demand the first and the most constant attention; and the very means taken to strengthen them tend to secure energy and balance in all the other vital functions—a statement that cannot be applied to mere muscle building. This should be obvious from the prevalence of the "white plague" throughout civilization; and when remedies of all kinds are so uncertain in combating this great scourge, prevention becomes the supreme need of the human family. And prevention means increased powers of resistance, which determine the line between health and illness.

But the lungs are expanded and invigorated not only directly for the benefit of their tissues and functions, but indirectly, or almost as directly, for the correction of the two most marked bodily irregularities—flat chests and drooping shoulders—besides giving the heart more room and aiding in promoting the activity of the abdominal organs. Now, even though the lungs can be enlarged most easily and quickly in the region of the floating ribs, and expand most readily downward, it by no means follows that the upper portions cannot be both enlarged and especially strengthened. It should be noted that the upper or least expansible portions of the lungs are first attacked by disease, and therefore these should be first fortified. Not only in youth, but up to about forty years of age, and even later, the joints and cartilages of the ribs permit sufficient movement to allow of the two deformities just mentioned being readily corrected. It is even advanced, as a theory, that baldness is largely due to the retention of the residual air in the upper portion of the lungs.

Though most of these points are doubt-

less familiar to our profession, I think them of such vital importance that they will bear repetition for the benefit of the younger members, or for those who thus far have not felt the need of special attention to systematic care of the body. I do not claim anything original as to principle, though as to methods I think I can fairly claim that these I give you are at once the most accessible, economical, and universal that could be named. Of course there are others recommended by such experts as Von Boeckmann, but, aside from his apparatus, they cannot, without apparatus save the light weights recommended, be simpler, more positive, or more practical.

THE BASIS OF ALL GYMNASTICS.

The expansion of the lungs, enlargement of the chest, and elevation of the shoulders by the methods about to be described may be justly regarded as the basis of all gymnastics, because they not only give freedom and vigor to the circulation of both heart and lungs and flexibility to the whole spinal column, but develop and strengthen the main muscles of the chest, back, neck, shoulders, arms, hands, and even fingers.

The only apparatus required are iron dumb-bells, two or three pounds in weight and long enough in the grip to give force to the swing of the balls. In all expansion exercises the lungs should first be emptied as far as possible of all residual air—which is done most readily through the mouth—and then filled, with gradually increasing fulness, through the nose. First expelling the air enables one to hold the breath with least detriment—if there be any.

The first and most fundamental of these exercises may be described as a lateral bending or tilting and twisting movement of the body, designed primarily for the stretching and enlarging of the body muscles, while the lungs are expanded to their utmost capacity. It can be readily seen that this is a most fundamental method of making room for the lungs. While the chest is enlarged to the limit of the joints and cartilages of

the ribs, the movement of the layer of muscles under tension must result in enlarging the chest and raising the shoulders. The various steps are these: Take the dumb-bells by the ends or balls, exhale the air from the lungs, and then fill them to their fullest capacity and, while holding the breath, the arms are swung five to ten times alternately diagonally across the front from side to side, the body being tilted laterally and twisted around as far as possible at each movement. The first aim for some months should be to swing the dumb-bells as high as possible; then gradually increase the tilt and twist; finally, while making the swing shorter and more forceful, direct the attention mainly to raising and rolling the shoulders. At first this exercise may give one a smothery feeling, in particular those who have not been given to deep breathing; but that feeling soon passes, and after a few months or a year or two, one takes this exercise as "daily bread," and would not skip it any more than he would forego a "square" meal when hungry.

Of course if one has temporarily yielded to the climate or is "under the weather," it is well to skip a day or two, just as one when indisposed can most profitably decline to dine.

This method of bodily development as contra-distinguished from mere muscle enlargement without reference to the vital organs on which life and longevity and prolonged activity depend—this expansion of the chest and invigorating of the spinal column may be styled *par excellence* the one best adapted, not only to the dentist, but to everyone of indoor life or sedentary habits, and is especially recommended as the middle period of life approaches, with its characteristic tendency to inertness or lethargy.

CHEST, SHOULDER, AND ARM EXERCISE.

Another good chest, shoulder, and arm exercise consists in exhaling and filling the lungs and then, while holding the breath, and with the dumb-bells held by the grip, throwing them back and forth with a twisting or spiral movement of

the arms. As will be seen, the longer the bells the more positive the spiral motion. These two exercises can be used alternately.

These methods of daily getting and keeping in "good form" for the daily struggle are most beneficial and least exhausting when taken for from ten to fifteen minutes each morning. At first five minutes may be enough to get the best results, but of course the time will be gradually increased as one gains vigor and becomes more and more interested, and finds such life-increasing and life-prolonging exercises a source of genuine enjoyment. If persisted in for a year or two, one will find not only a gain in bodily strength, but such an increase in mental vigor that such exercises will be continued until they become a life-habit.

THE AUTHOR'S METHOD OF EXERCISING.

But there is another form of exercise that I adopted years ago as an excellent preparation for the two just described. At the risk of chilling the interest of the reader and dampening his ardor, I can briefly describe this preliminary form of exercise as the vigorous rubbing that secures best results from a cold or cool bath, which I take every morning in warm weather and two or three times a week during the winter.

This rubbing, which should be done with a tough, corded towel held by the ends and "sawed" over the shoulders and around the body, is decidedly superior to a Whitely exerciser or any other apparatus that merely stretches arm muscles without other positive benefit. The idea is to make the rubbing and "sawing" regular gymnastic exercises. This is obviously developing and absorbing energy, and brings one as near the Eldorado once so ardently sought as one is likely to approach. Of course there are many that must modify the temperature of the water to suit their requirements. In either case, there is nothing passive about this form of exercise, as is the case in massage and Turkish baths; and personal activity is certainly the first condition in reaping the best results. I

am bound to admit that it takes some force of will at first, as well as an abiding interest in one's program, but judging from experience, I know of nothing that so renews and equips one for the battle of the day as one-half to one hour spent on the three numbers of the program that I have drawn up. It may suggest a little more of the strenuous life than all are yet quite willing to adopt, but I can say for myself that after years of experience I enjoy beginning the day in this manner almost as much as I enjoy closing it among my books, with an occasional evening in my basement shooting gallery, either alone or with a comrade.

I cannot speak as an expert in training for endurance, but it seems to me that these simple methods tend to develop and maintain the longwindedness so essential in many kinds of athletic sports or contests, and they are the basis of that perfect poise and steadiness so needful in marksmanship. In regard to this latter form of sport or recreation, I might modestly claim that I am entitled to speak with some confidence after about thirty years' experience with the rifle and eight with the pistol, on most of my weekly half-holidays from

April to November; and though the majority may prefer other kinds of sports and recreation, I would strongly recommend shooting, for the reason that it is a good corrective for the continued use of the eyes at close range. And if one desires to strengthen the voice for speaking or singing, or both, I know of no exercises as a basis so well designed to accomplish that purpose. Again, if one must coin all his ideas and energies into a bank-account, he should daily reinforce himself with such simple and invigorating gymnastics.

Finally, it is the hope of the writer that he has not been taxing the reader's time and attention with arguments and illustrations devoted to a program that should always speak for itself. I will sum up by repeating that our civilization, which has substituted to such a large extent the artificial for the natural, and indoor for outdoor life, makes it imperative that one must be disciplined and equipped by such or similar lifelong habits as are here recommended; not so much to prolong our days as to maintain our powers at their highest vigor, and thus enable us to ward off the feebleness and disabilities of age as long as possible.

A TIME-SAVING ATTACHMENT FOR THE ARCH BAR.

By D. B. WILLIAMS, D.D.S., Wilkes-Barre, Pa.

(Demonstrated at the meeting of the Susquehanna Dental Association, May 21, 1907.)

MANY practitioners have condemned the arch bar and its accompanying fixtures because of the great amount of time consumed in changing or tightening the wire ligatures which are generally considered indispensable when expansion of the arch is the object desired.

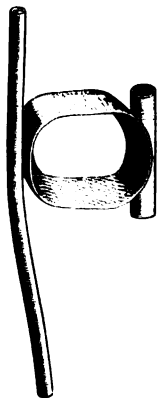
That they are amply justified in so doing cannot be denied, especially when

we remember the trying moments spent in passing the unruly wires between closely approximated teeth—and not only trying to the operator but painful to the patient; because, generally, the end of a ligature which is being passed palatally (or lingually) will persist in burrowing into the gum tissue, causing profuse hemorrhage. This burrowing of the wire ligature will occur in a large

percentage of cases, notwithstanding the greatest care on the part of the operator.

The unstable nature of the ligature attachment is also a strong objection to

FIG. 1.



its use, the patient having to exercise the greatest care in brushing, for fear

FIG. 2.



of disturbing its precarious hold, or of stretching it and so diminishing the tension.

To overcome these objections and also to bring about expansion more positively in the area in which it is most often needed, *i.e.* the bicuspid region, I have devised the means of anchorage and attachment now to be explained.

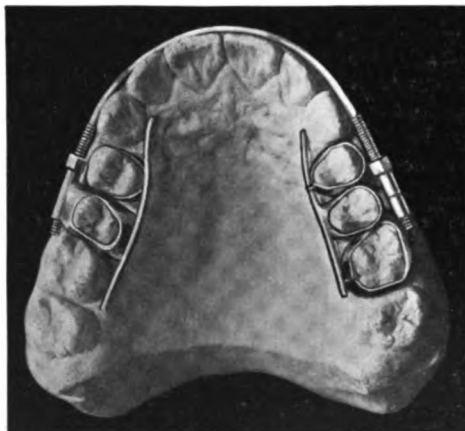
In the case of a contracted arch

where expansion is desired, German silver bands, about No. 34 or No. 35 gage, are fitted about the first and second bicuspid and the first molar on both sides of the arch, the soldering or closing of these bands being from the palatal (or lingual) side; 16-k. gold solder should be used for this purpose. The surplus band metal is clipped off about one-sixteenth of an inch from the band proper, thus forming a lug with the minimum of trouble.

The second bicuspid band is generally selected as the one to bear the tube which engages the arch bar; so the tube is now soldered to its buccal side with 10-k. or jeweler's solder—a tube on each of the second bicuspid bands—care being taken to place the tubes as nearly parallel as possible, to facilitate the passage of the threaded ends of the arch bar.

After the tubes have been correctly placed, a piece of German silver wire of about No. 17 gage is soldered—using

FIG. 3.



soft solder this time—to the palatal (or lingual) surface of the band extending distally along the first molar and mesially as far as the canine, care being taken to keep it just sufficiently far from the soft tissue to avoid contact.

This band, with its tube and palatal wire, when finished will appear about as it is shown in Fig. 1.

It is now cemented upon the tooth,

and the bands which have been made for the first bicuspid and first molar are afterward cemented upon their respective teeth, the lugs which were formed upon the palatal surfaces of these bands serving to check an ever-present tendency of the anchor teeth—under the influence of the arch bar—to elongate.

In Fig. 2 the appliance is shown in position. The bands on the right first bicuspid and first molar (on the left facing the illustration) have not been placed in position, so that a clear view may be obtained of the German silver palatal wire in its correct position.

On the left side (on the right facing the illustration) these bands are in position, and the lugs may be seen in a position which will restrain any tendency of the second bicuspid toward elongation.

Fig. 3 shows the whole appliance in position, ready for work.

It can easily be seen how simple a matter it is to adjust or remove the arch bar when once this method of anchorage is obtained; and the great efficiency of the bar for expansion in the bicuspid region is clearly evident.

Again, the absolute stability of the bar is of inestimable importance should it be found necessary to rotate any of the anterior teeth—this being, in the writer's opinion, one of its most important advantages.

If the tubes have been properly set, the bar will slide in and out of its anchorages in a second's time, and the palatal wires, which cannot but follow its outward movement, render the use of the wire ligature unnecessary.

ORTHODONTIA AND ORTHOPEDIA OF THE FACE.

By V. H. JACKSON, M.D., D.D.S., New York, N. Y.

(Read before the Massachusetts Dental Society, at its annual meeting, Boston, Mass., June 5, 1907.)

MR. PRESIDENT and gentlemen of the Massachusetts Dental Society, it gives me great pleasure to meet with you today to discuss the subject of "Orthodontia and Orthopedia of the Face."

"Orthodontia," in general terms, is the moving of malposed teeth to a correct position. "Orthopedia" is the *correction* or the *prevention* of deformities. Orthopedia of the face includes the changing of the shape of the jaws and the correction of irregularities of the teeth.

Facial orthopedia is a great science. Every practitioner of dentistry should at least have a general knowledge of the subject, so that he may be able intelligently to advise his patients.

The immensity of the field for the practice of facial orthopedia I am sure is not yet realized by a majority of the

dental profession, as most practitioners, when their minds are trained on the subject, can every day see numbers of cases about them, and in general practice, where the conditions could be improved by orthopedic treatment.

Recently, in a talk I gave on this subject, I stated that the facial orthopedist might be termed the guardian of the face; that he is responsible, to an extent, for the shape of the features of his patients, and I might say of the public.

When necessary, he should point out what should be done to improve the occlusion of the teeth and the features of the child, and recommend that the operation be performed early, while the bones are less dense and are developing.

He should point out what should be done to improve the conditions for the old lady or the old gentleman with mal-

posed teeth, or for the adult of any age.

Many elderly persons are afflicted with pyorrhea alveolaris. When there is pyor-

FIG. 1.



FIG. 2.



rhea there is swelling of the soft tissues, which forces the teeth into objectionable positions, *e.g.* some of the incisors protruding or rotated, irregular spaces be-

FIG. 3.



tween the teeth, etc. The unhealthy condition in these cases should first be treated. Teeth elevated in their sockets from this cause should not be forced back into their alveoli, as that would deepen the pockets between the gum and the teeth, and lessen the chance of bringing about a healthy condition. The elevated teeth should be dressed to harmonize with the adjoining ones, and shortened so that they will not rest too heavily in occlusion. The malposed teeth should be moved into line, and be retained there continuously for a time, usually with the same device, and later the appliance worn regularly at night.

You will note that most of the apparatus recommended by me is removable by the patient for cleansing. In studying the patient's best interests, removable apparatus seems necessary so that the teeth and appliance can be carefully cleansed, keeping the mouth in a prophylactic con-

dition. This was one factor that led me to devise removable regulating appliances.

There are three general reasons for the expansion of the dental arch: First, to permit malposed teeth to take proper alignment; second, to improve the facial lines; third, to broaden the nasal cham-

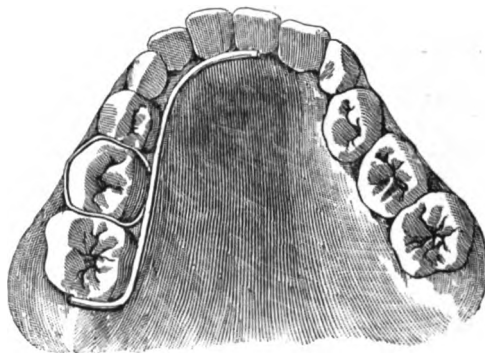
FIG. 4.



bers to increase the capacity for nasal breathing. The latter I might say is all-important, as it concerns the future health and welfare of the patient.

The roof of the mouth is the floor of

FIG. 5.



the nose. Expansion of the dental arch, to be most effective, should be done early in life while the palate processes and adjacent bones are still in the developmental stage. Gradual force exerted while the patient is young encourages natural development of these parts.

Some of my hearers are familiar with the system I am here to describe, and

others perhaps have merely enough knowledge of it to condemn it. There is a growing interest in the method as its merits are better understood.

I will hastily review the method of anchorage, with charts, and incidentally point out some of the advantages of the

plate metal, usually of 18-karat gold—although other metals may be used—rolled to No. 36 gage, is contoured with contouring pliers so that it will fit the tooth at the neck and at the grinding surface, as illustrated in Figs. 1 and 2. When the appliance is to be gold-plated

FIG. 6.

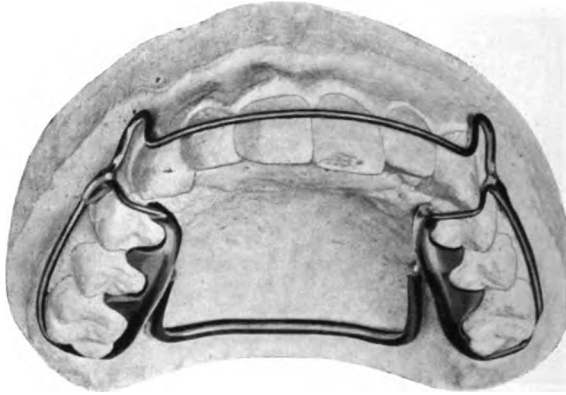


FIG. 7.

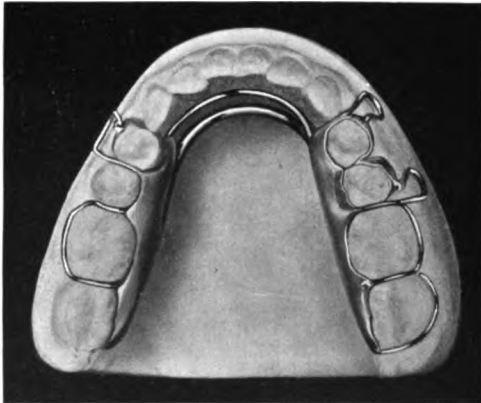


FIG. 8.



system, and also some errors in technique that would prevent the procuring of good anchorage.

An accurate cast is the first essential. Slight carving of the model at the neck of the tooth is generally an advantage. Excessive carving of the model at this point will always bring about a misfit of the appliance.

The PARTIAL CLASP, a thin piece of

the partial clasps can be made of German silver.

If the model be over-carved at the neck, when the appliance is finished and applied in the mouth the partial clasp will ride on the natural tooth at that point, near the neck, and leave a space between the partial clasp and the tooth near the grinding surface. This is always objectionable. (See Fig. 3.)

A **SPRING CLASP** is a piece of No. 21 or 20 spring wire of silver-nickel, platinum, German silver, or gold, bent twice at right angles, having the width between the parallel sides equal to the antero-posterior width of the tooth to be clasped. (Fig. 4.) The part between the parallel bars is contoured to fit the tooth near the gum on the opposite side of the tooth from the partial clasp.

. Fig. 5: The ends of the spring are bent to extend over the arch at the junction of the teeth to rest on the partial clasp on the opposite side of the tooth, where they are finally soldered.

In the anchorage portion of the appliance, the partial clasps are arranged on the lingual sides of the teeth on the model, with a **BASE-WIRE**, about No. 12 or No. 13 gage, extending from front to back, to which they are soldered.

When the wires of the spring clasp passing over the arch interfere with the bringing about of a correct occlusion of the teeth, the wires should be changed. If the ordinary spring clasp is at fault, it can be replaced by a continuous spring clasp: that is, the wires can pass from the lingual to the buccal side in the distal and anterior part of the arch, as shown in Fig. 6, or the wire can extend over the arch at any point the occlusion will permit.

I would mention a mistake that is occasionally made with some forms of apparatus, in not having the anchorage portion of the appliance strong enough. It will be noted that chemically pure tin, which I recommend as a solder, when in a bar is easily bent; therefore, before uniting the parts of an appliance with solder, sufficiently large wires should be arranged to pass from front to back in the anchorage along the lingual side of the teeth to resist any force required.

It is found in practice that the use of chemically pure tin as a solder is preferable to jeweler's soft solder, as in the latter the presence of lead when used in acid mouths acts as a negative, and makes the appliance more liable to tarnish.

The chemically pure tin (procured from a manufacturing chemist) is best

prepared for use by being melted and run into molds, making bars about three-thirty-seconds of an inch thick and one-fourth of an inch wide. It is then cut into convenient lengths for soldering. Zinc muriate is used as a flux.

[This was followed by a talk, illustrated with sixteen charts, showing—A method of applying force scientifically by means of a tracing (see *Cosmos*, 1906, page 1087); expansion and contraction of the arches; equalizing the jaws, correcting the median line by moving the teeth laterally, etc. (See *Cosmos*, 1906, pp. 278, 1085).]

The rotation of canines, bicuspid, or molars is often required to bring about a correct interdigitation of the teeth in occlusion. Their rotation can be easily caused at the same time that other movements of the teeth are being made, as the expansion of the arches, equalizing the arches, etc.

In making the apparatus—to be always removable by the patient—a thin collar with a hook-shaped lug on the buccal side should be cemented to each of the teeth to be rotated. A spring wire, about No. 19 gage, is usually arranged to extend from the anchorage portion of the appliance over the arch at the junction of the malposed tooth with an adjoining one, from the lingual to the buccal side, where the spring is formed into a U-shaped loop about one-fourth of an inch long projecting under the lip. The free end of the wire is made to engage with the lug on the collar, the end terminating near the grinding surface of the tooth. Fig. 7 shows an appliance arranged for the rotation of three lower bicuspid, at the same time expanding the arch.

Force is caused for rotating the tooth in either direction by bending the free end of the spring backward or forward according to the direction of the force desired. Additional force is caused by changing the shape of the spring about once a week. In adjusting the apparatus, the patient hooks the end of the spring over the lug.

Fig. 8 illustrates an appliance for the bucco-distal rotation of the upper

first molar on each side of the arch, right and left, at the same time moving forward the incisors to cause room for teeth not erupted. In order to make the spring more active, the end of the loop portion is sometimes bent into a complete circle or coil, with the end of the spring extending to engage with the lug as described. (See the figure.) In removing the apparatus, the patient first disengages the ends of the looped springs from the lugs.

If additional force be required at any time, two springs can be utilized for the rotation of a tooth, one arranged to rest against a lug on the buccal side of the collar, and the other on the lingual side, as shown in the illustration. In such a case no partial clasp would be employed on the tooth being rotated.

Any number of teeth can be rotated at the same time.

[Followed by a demonstration with models.]

CORRESPONDENCE.

ARMY AND NAVY DENTAL LEGISLATION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Both editorials in the current issue of the *Cosmos* are timely. In this letter I desire to refer to the one respecting army and navy legislation, neither commending nor criticizing it, as I am not able to answer your question, "What has the National Dental Association to show to the dental profession in the matter of results for the expenditure of time and money that it has made in this vitally important work?" On some future occasion, with your permission, I would like to discuss the organization of the N. D. A. on the lines of the National Education Association, which has recently been chartered by Congress, giving it a prestige it did not possess under the charter of the District of Columbia.

Last June I read a paper at the meeting of the American Medical Association on "The Dentist in the U. S. Navy." Fifty thousand copies were included in its *Journal* issued November 2, 1907, together with the discussion and resolutions unanimously adopted by the Section on Stomatology and the House of Delegates of 150 representatives of 2300 members, which is the business body of the American Medical Association. After

the reading of the paper and its discussion, it was proposed by Dr. Brophy that "The section, with the indorsement of the general body, adopt resolutions along the line suggested by Dr. Grady, so that the legislators-elect will see that the wishes of the people are carried out." Dr. Talbot, secretary, did not think that the House of Delegates "would take any action on it at present under the peculiar condition of things as they now exist. We tried it in the army matter, in the same way, and they flatly refused to have anything to do with it."

As a matter of fact the House of Delegates did take favorable action, report of which I include, with some words from an explanatory letter to me from Dr. Talbot, dated November 2, 1907:

RESOLVED, That it is the sense of this House of Delegates that the efforts of Surgeon-gen. P. M. Rixey to secure legislative authority for the employment of dentists in the U. S. Navy be approved, and that the Committee on Medical Legislation be instructed to exert such influence on Congress as in its judgment may be deemed wise in support of the measures making such provision.

"Dear Dr. Grady,—I notice, this morning, your article and the discussion published in the *Journal* of the American Medical Association."

tion. I read it over, with the discussion, with a great deal of interest. I am very glad that the whole thing has been published in full and that good results will be obtained therefrom. Two years ago we tried a similar arrangement with the army bill. At that time an army surgeon was in the House of Delegates, and he killed the entire business. I am glad that it passed the House of Delegates favorably. It should have some weight in Congress. I have had occasion abroad this summer, and at home, to refer to your splendid paper and the importance of the subject, coming from one who has had such a large experience in this line of work. An entirely different phase is put upon the subject, which was not understood by the profession at large. I am sure that you will be the means of good results in this matter as you were originally in the matter of manual training schools."

I have been astonished at the unanimity of approval I have received. An editor well known to your readers writes: "It certainly is gratifying to note the growth of interest in dental matters by those connected with the naval service. It seems to be a hopeful sign that this interest is increasing, and I certainly congratulate you upon the advancement which you have obtained in bringing about this result." A high-ranking (line) officer in the navy says: "I think you make an excellent argument, and I sincerely hope that you will meet with success in the matter. Of course, if they commission dentists in the navy, that is the thing that you should most desire, for it not only provides for the present, but for the future when old age creeps on. I agree with you that the time is ripe for such an addition to the navy." On my return from the Naval Medical School, Washington, where I had been ordered by the Secretary of the Navy to proceed for the purpose of delivering lectures on the subjects of dental emergencies and the care of the teeth of the navy *personnel*, I received a letter which read in part: "Your lectures before the school were much appreciated. I hope you will be able to give us the same course next year. It is very necessary for the naval surgeon at present to have some practical idea on the subject of dentistry.

It is hoped that before another year passes the dental corps will be established."

This act of the Secretary of the Navy, said Dr. James McManus, in discussing my paper—"makes for the benefit of the dental profession before the public. It is well that the highest order of surgeons in the country have asked a practicing dentist to address them and give them some information on the care of the mouth and teeth"; and this thought is confirmed by Dr. Evans in his "Memoirs": "I received my appointment of 'surgeon-dentist' in the same form and on the same terms as the other doctors and surgeons. We all received the same compensation. I am sure that the consideration which had been shown to me by nearly all the royal families of Europe has been of very great service to me personally, and I am equally sure, but still more pleased to believe, that my profession has been benefited and honored also."

If further encouragement is needed I give some words by members of Congress when the bill for dental surgeons in the navy was under discussion, in February 1907:

In reference to the desirability of having dental surgeons in the navy, certainly some provision ought to be made for them.

The navy probably needs dental surgeons as much as the army, and it has worked admirably in the army. Providing, dental surgeons in the navy ought to be on the same basis as the dental surgeons in the army.

Put these men on the basis they are entitled to have in accordance with the dignity of their profession.

Both arms of the service should be alike, so that we shall not be constantly hammered to raise one to the level of the other.

You would cripple the efficacy of this proposition if you made it impossible to get dental surgeons who could remain away for a term of years, which you could not do if you should merely make them contract surgeons.

The committee in providing for dental surgeons discriminates against them. An assistant surgeon of the navy must be appointed by the President and confirmed by the Senate. Now it is proposed to give the same

rank to a dental surgeon, but his appointment is not confirmed by the Senate; he is appointed for a term of years—no one knows whether it be for one year or fifty years—but at the pleasure of the President. Certainly if we are going to provide these surgeons in the navy we ought to provide them on exactly the same basis as other assistant surgeons. An assistant surgeon is a commissioned officer.

What class of men are obtained in the army—students, beginners? No, an excellent class of men. But every one of them now asks for a commissioned rank. Do not want to see one branch of the service get a commissioned rank and have thirty odd men the other way in another branch of the service.

I submit the bill proposed by the Committee on Naval Affairs and the bill proposed by the National Dental Association, and invite attention to these words of Dr. Ottolengui, because both arms of the service should be on exact equality: "The army bill provides eventually for majors, *but only after ten years' service*. The navy provides for one 'surgeon,' *immediately*. 'Surgeon' in the navy is equivalent to 'major' in the army. . . . Explain to us why it seemed needful to have a civilian board of control for the army and not for the navy!"

Bill of the Committee on Naval Affairs.

The text of the bill offered February 14, 1907, as an amendment to the Naval Appropriation Bill, consists of one paragraph, which follows:

That the President be, and he is hereby, authorized to appoint dental surgeons to serve the officers and enlisted men of the Navy and Marine Corps, not to exceed thirty in all. Said dental surgeons shall have the rank and compensation of acting assistant surgeons in the navy; shall be graduates of standard dental colleges, trained in the several branches of dentistry; of good moral character and professional standing, and shall pass a physical and professional examination; and their appointment shall be for a term of years, and revocable at the pleasure of the President; and the sum of \$50,000, or so much thereof as may be necessary, is hereby appropriated for that purpose.

Bill of the Representatives of the Dental Profession.

That the President be, and he is hereby, authorized to appoint dental surgeons to serve the officers and enlisted men of the Navy and Marine Corps, in the proportion of not to exceed one for every one thousand of said Navy and Marine Corps, and not exceeding thirty in all. Said dental surgeons shall have the rank and compensation of acting assistant surgeons in the navy, and shall be graduates of standard dental colleges, trained in the several branches of dentistry, of good moral character and professional standing, shall pass a satisfactory professional examination and shall meet the age and physical standards required of officers of permanent tenure.

Provided, That there shall be first selected a member of the dental profession who is a citizen of the United States and a graduate of a standard dental college, and whose aptitude and experience evidence eminent fitness for conducting the professional examinations and for assisting, under the direction of the Surgeon-general, in equipping and supervising the operations of the others, who shall be first appointed acting dental surgeon with the rank and compensation of surgeon.

Any of these appointments shall be revocable at the pleasure of the President. *Provided further*, That the dentist now employed at the Naval Academy shall not be displaced by the operation of this act.

I have been asked, on account of my years of experience and knowledge of affairs, from Washington and also by a member of the Executive Council, N. D. A., to draft a bill providing for dental surgeons in the navy. It is a cardinal principle with me not to protect myself from causes which solicit my support. Against my complying is the resolution of the N. D. A. that all matters connected with the army and navy shall be transacted through the duly accredited committee of the association, and an executive order prohibiting any action on my part designed to secure legislation in Congress. I have had experience in legislation, previous to my connection with the Naval Academy, and what I have written in dental laws has been accepted on two occasions without the change of a word or a punctuation mark. I have been tempted to advise

with Dr. Wms. Donnally respecting the matter, because I have often wondered how he could carry all he knew concerning legislation, and enlighten members of Congress themselves, outside of dentistry, as he did at the hearings before the Military Committee. One of the strong features would be that he is in a position to be personally on the ground all during the next session of Congress. Confusion in the initial stage of the proceedings might jeopardize the measure.

A promising phase of the preliminary situation attaching to the effort to obtain dental surgeons for the navy, which the dentists of the country have desired for years, is the comprehension and co-operation of the navy *personnel* and the American Medical Association, which has committed itself to the advocacy. Says Dr. Ottolengui: "I believe there is a difference between the attitude of the army and naval surgeons toward the army dentist. It was the army surgeon who prevented the dental surgeon in the army from having any real recognition; but the medical staff of the navy are not opposed to giving rank to the dental surgeon."

It seemed to me that the strength of the movement would lie in the fact that it is indorsed by the Surgeon-general of the Navy and by the American Medical Association. These indorsements we now have, in the resolutions adopted, and in the words of Surgeon-general Rixey that the importance of the care of the teeth "to the health of the navy is appreciated," and asking that legislation "be obtained giving advantages to the enlisted men of the navy similar to those which the army has had for several years."

What is needed is that those who really have the interests of the service and of the profession at heart may combine their efforts and make them effective, as a unit, when Congress meets in December, in the enactment of a comprehensive measure free from admitted defects or significant omissions, which shall be satisfactory to all parties because promotive of the interests of all. A cautious conservatism is the duty of the hour; conservatism in method, and co-operation and forbearance in thought and action.

RICHARD GRADY, D.D.S., M.D.

ANNAPOLIS, MD., November 1907.

PROCEEDINGS OF SOCIETIES.

MASSACHUSETTS DENTAL SOCIETY.

Forty-third Annual Meeting.

(Continued from page 1192.)

SECOND DAY—*Morning Session.*

THE meeting was called to order at ten o'clock Thursday morning by the president, Dr. M. C. Smith.

The President announced that the first order of business for the morning session would be a paper by Dr. RICHARD GRADY, Annapolis, Md., on "Opening the Doors of Dental Knowledge to the People," as follows:

OPENING THE DOORS OF DENTAL KNOWLEDGE TO THE PEOPLE.

Mr. President, and ladies and gentlemen,—I take it as a great distinction to be asked to come among you on an occasion such as this forty-third annual meeting. "Not chance of birth has made us friends, but the endeavors for the self-same ends, with the same hopes and aspirations." The most agreeable thing about any successful dental meeting is the solid satisfaction resulting from the interchange of ideas and from professional and social contact. The comparison of ideas is always educational. The title I sent your chairman was, "Opening the Doors of Dental Knowledge to the People," but the "public," as printed, will do as well, as it accords with Chalmers' words, "The public!—why, the public's nothing but a great baby!" The dentist and medical man know, as the public at present does not know, the grave remoter effects upon physique and health due to the neglect of the teeth. The question for dentists and physicians to

answer is, What practical steps can we take to convince the public of the gravity of these facts?

I may not be able to say anything really new, but different ways always remain of saying old things. I realize the force of iteration and reiteration. It would be difficult to find any earnest man of action who has not a hobby. He ought to have one, for nothing short of a hobby will develop one's energy and enthusiasm. The beneficial hobbies of men, as distinguished from those of doubtful utility, are illustrated in those which result in the organization of charities and educational institutions. One man, for instance, through some chance association, becomes interested in the lame, and assists in founding a hospital for their treatment. His friend, perhaps, has drifted into the schools, has sought to make them better, and becomes absorbed in educational work. These men, and all others like them, do a great deal of good in the world. They are the mainstays of all the great array of institutions that care for and help humanity without asking any reward on earth. Witness, for example, the instructors, past and present, of your Harvard Dental School—"their own work and at their own expense," says Dr. Shepard.

Now, to read in the current number of the Cosmos [June 1907] my paper, "Oral Hygiene in Public Schools and Institutions: What Are We Going to Do About It?" you might conclude that my hobby consists in insisting upon the value of the teeth to the individual and to the

state, and this thought is emphasized by Professor Osler's words, which we have believed but not proclaimed aloud: "If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say defective teeth"; and by Sir Frederick Treves, the distinguished English surgeon, who says, "Everybody seems to be on a diet. If people were a little more careful about their teeth, they would not need to be so careful about their diet." My association with orphan asylums, reformatories, schools for the blind, and as resident dentist at the U. S. Naval Academy, not counting private practice, has impressed me with the need of spreading hygienic knowledge concerning the mouth and teeth, and of instructing young people themselves as to their care. The agitation begun by me in 1900 in the American Medical Association and in the National Dental Association has been continued. What has been accomplished is partly known. The press has been enlisted, magazines drafted into the service, dentists throughout the country inspired to lend a hand, and a vast amount of information spread broadcast among the people. The editor of a daily paper writes, "Since the committee have mentioned the subject of the teeth of school children, we have been astonished to notice the almost desperate condition of the teeth of many of the young girls one can see going about the city. In holiday times, when one sees the city's youths and maidens more, so to speak, in bulk, it is not difficult to pick up rather startling evidence under this head. We have seen dozens of otherwise pretty faces absolutely ruined, so far as appearance goes, whenever the lips were parted."

Is it not high time that the profession put an end to public ignorance respecting the care of the mouth and teeth? In the presence of men and women of your training and experience, it is not for me to pursue this line of thought in detail. "Anything can be that has the support of twelve or even six men," is the sentiment of Dr. J. Leon Williams. It would be highly gratifying if these six wise and

earnest men could be found in this Massachusetts Dental Society, which contains men of ability to carry this, or almost any other movement into which they put their hearts, to a successful issue. In your published report you will make known to a far wider circle than your own membership the suggestions and ideas brought out at this meeting, and on account of the prominent position which you have reached in the interest of dental advancement, you will be given respectful attention. I am especially anxious that you be heard on the philanthropic and beneficent question I am advocating. In the words of another: "You have just one gospel to preach, and that is, the gospel of cleanliness of the mouth, the cleanliness of the teeth, and the cleanliness of the throat. These three things must be your text throughout life; oral hygiene, the hygiene of the mouth—there is not any one single thing more important to the public in the whole region of hygiene than that."

Investigations show that 96 per cent. of the inhabitants of Sweden have defective teeth, and America comes second with 93 per cent. Of army recruits, 20 per cent. in Germany and 24 per cent. in England have practically useless teeth. Of 18,000 young men refused enlistment in the U. S. army in one year, 1000 were rejected on account of bad teeth alone. Of fifty or more particular cases reported by the Committee on Naval Affairs at a session of Congress last February—

One apprentice, but sixteen years of age, had lost every one of the teeth from his upper jaw; another, aged eighteen years, exhibited cavities in his fourteen upper teeth; another, aged sixteen years, had lost practically all of his molar teeth, and the few remaining teeth were imperfect; another, aged seventeen years, had lost seven teeth, and another, aged eighteen years, had lost seven molar teeth. Several others of the fifty cases from sixteen to eighteen years of age, had lost from three to six teeth. It was said of these cases, in general, that they presented either ordinary cavities of decay; dead teeth; inflamed gums; chronic abscesses discharging pus in the mouth; pus-producing diseases of the teeth, gums, and underlying bone, or germ-laden foreign matter in contact with

the gums and teeth. Such conditions cause gastric and intestinal disorders, impair vitality, and make one more susceptible to infectious diseases. Experts in dentistry inform us that, under present conditions, a large percentage of the cases exhibited from this one station must inevitably lose their teeth at an early age, which may render them pensionable under existing law.

The intelligent have a right over the ignorant—the right of instructing them. In the earliest days of Cambridge University everyone who attained to the title “Doctor” gained thereby the right to teach. “Dentistry would have no claim to be called a liberal profession,” says President Eliot of your honored university (the first to establish a dental school), “did not its practitioners manifest zeal for teaching.” Work for other men, effort for their well-being, this is the summons and the movement of the times. The possibilities of our powers and of our enthusiasm are not realized or appreciated because we do not move in the pathways which open to us. Are we all sincerely working for the upbuilding and glory of our calling, in honoring which we honor ourselves? Let us confide in the power for good of the public sentiment of the profession expressed in societies like this, in dental journals, in daily conversation, reinforced by the informed opinion of the educated public. “The noblest motive is the public good.”

Rev. Dr. Hale, in an address in this city, asked, “What are the distinctions between a guild of craftsmen and a guild of men of liberal training?” One distinction is that the master of the liberal arts, by whatever name he may be known, has no secrets in his calling. Dr. Perry of New York says, “Men who receive the benefits arising from membership in a liberal profession assume an obligation as binding as if acknowledged under oath.” The artists to whom we owe the birth of fine art in the middle ages are noted for the loyalty with which they taught all they knew. We honor Fauchard, sometimes called the “father of dentistry,” not for his great skill, for in that he may have been excelled, but for the earnestness displayed in making known to his compeers and placing at their disposal

all that he had learned. It was this fraternal spirit, an earnest desire to make the profession of his choice more useful to the community, that made Pierre Fauchard a great man. And the same may be said of Jenney, whose remarkable achievements revolutionized building and who has fifty monuments, some of them higher than your Bunker Hill Monument. He might have made millions by patenting his inventions, especially the skeleton construction now generally used for tall buildings, but William LeBaron Jenney freely gave every idea he had to his fellows, and to him money was but a minor consideration.

The knowledge of all the fundamental principles of a medical education is necessary for the dentist. It does not so much matter what the title is that distinguishes the profession—dentistry or stomatology—the name is not material so long as the members have the knowledge to impart. They must let it be known that operations which a few years since were deemed totally impracticable can be and are being successfully performed; that disease of the teeth is not always a mere local affection of the teeth, but may and very generally does arise from constitutional causes; that their welfare is ultimately connected with that of the general system, and recognizing systemic conditions in their patients demanding the care and service of a physician, they should advise them intelligently and thereby promote not only their health, but also a sense of reciprocity between dentists and physicians. We have removed our field and separated ourselves from those whom we should recognize as co-workers. So young a profession as dentistry may well follow the example of the older profession of medicine. The dental profession has much to gain in many ways by a close alliance with the medical profession. The position of being a branch of the powerful medical profession gives it advantages many and great, and it would be folly to cast these away. The days when the public mainly judged the merits of the dentist by the celerity and freedom from pain with which he robbed his patients of

possessions which could never be really replaced, are long gone by. The art of the dentist is now pre-eminently a conservative—a preservative one.

Physicians are acknowledging a duty to contribute whatever there is in the science and art of medicine for the general welfare, and this in a way apart from the customary office and consultation practice, as witness the titles of some of the papers at the American Medical Association, from which I came last night, and which by establishing a section on stomatology thereby recognized dentistry as a specialty of medicine, conferring dignity upon our calling and giving its practitioners standing as professional men: "Investigations of the Continued Fevers in Southern Georgia," "Race Suicide," "Symposium on Pure Milk," "Education Propaganda for the Prevention of Tuberculosis," "Educational Problems—Schools that have Adopted Systems of Physical Education and Thorough Medical Inspections," "Some Needs of Institutional Children," "Defective School Children," "Necessity of a Medical Education of Dentists from the Standpoint of the Lay Public," "Results of Narrow Arches Treated Understandingly About the Sixth Year," etc.; and in this connection it may be noted that Dr. Bogue is one of the great advocates of treatment for irregularity of front teeth and a generally crowded condition as soon as the permanent first molars are sufficiently developed to hold an appliance, while Dr. I. B. Davenport in the case of his son began treatment by using plates before the child was three years of age. Dr. W. S. Davenport says, "There is no doubt in my mind that in the near future orthodontia will develop, like other branches of dentistry, into preventive rather than curative methods. It is our duty as a profession to instruct parents what a normal condition is, and to bring their children to us as soon as they have teeth. We shall then be able to see if irregularities are forming and to advise in regard to abnormal conditions of adjacent organs, or warn against bad habits which might prove detrimental."

Where the dental practitioner was once

paid in great part for his skill in restoring organs which had suffered wreck by the destructive action of disease, he is now in increasing measure bringing in wherever possible that best of cures, prevention. Such physicians as have the aptitude are lecturing on the prevention of disease, hygienic and physiologic laws, the influence of heredity, the essential facts concerning tuberculosis, and similar topics respecting health. Such lectures are being given by members of the faculty of your Harvard Medical School, and under the auspices of the New York Academy of Medicine, the Chicago Medical Society, and county medical societies, as well as the New York Board of Education and other organizations. During the past three years, F. P. Hyatt, D.D.S., has lectured in the public schools of New York, under the supervision of the Board of Education, on the care of the teeth, in what is known as the public school course, but unfortunately children are not admitted to his lectures. He is the author of a booklet, "The Care of the Teeth," similar in title to the classic by a member of your society (Dr. Hopkins), whose object, as expressed in the introduction, is "to mark out a simple course of prevention that may be useful to the dentist, to the physician, and to the individual." As confirming the central thought of my paper I quote these words of Dr. Hopkins:

Observations made during an active practice of over twenty years have convinced the writer of the truth of two propositions: First, that a large proportion of dental operations are preventable; and, second, that a large proportion of the world's inhabitants are ignorant of how to prevent them. The most useful dentist is not that one who is content to repair damage and restore loss, but that one who labors unceasingly to prevent such disastrous conditions from occurring. As far as the teeth of the well-to-do are concerned the idea of preventive treatment is beginning to be understood, but the question of what we can do to improve the teeth of the poor calls for most thoughtful and prayerful consideration.

The New York Association for Improving the Condition of the Poor has found that the lack of proper dental care

in the days of their youth has made thousands of men and women dependent because of their being industrially inefficient as a result of poor health due to poorly masticated food. A tooth-brush campaign among school children is in prospect. The Board of Health believes, too, that no child should be allowed to enter school until his teeth have been cared for by competent dentists under the supervision of the board. Ten dental examiners would be assigned to the schools just as medical examiners are now. The association has asked Bellevue and allied hospitals to open a free dental clinic for school children.

That these contributions of Dr. Hopkins and Dr. Hyatt and others are very valuable indeed, no one can question who reflects that there is really nothing in the whole range of human possession so precious to a man as his health. "Health is first wealth." No nation can rest secure which has not regard for the sanitary essentials by which health is safeguarded. One of the most salutary ways by which our profession can help the community is in demonstrating scientific principles. Science is only another name for orderly common sense, and there is probably nothing more needed by the people than the application of such science. Of all departments of science connected with medicine, hygiene, including oral hygiene, may be most profitably studied by non-professional persons. The espousal of the principles of hygiene may be regarded as the clearest evidence of the social and intellectual advancement of any community. "The refinement of a nation is to be judged by the care bestowed upon the teeth." Is it right, therefore, that the vast research respecting the hygiene of the mouth and control of dental disease, which has employed practitioners of dentistry for years, should go for nothing in education—that this wealth of knowledge should be passed by as if it had no existence, and the young people of the country grow up as ignorant of it as if they had lived centuries ago? What do we live for, if it is not to make life less difficult?—

We herald a day that is coming;
The hope of the race is the child.

A large amount of suffering may be avoided through proper knowledge conscientiously applied. It is recognized by physicians and dentists that sound teeth are essential to the health of the human organism in general. It would be a great saving of Young America, and thereby of all America, if boards of health appointed dental inspectors to visit schools periodically and examine children's teeth, and if dental infirmaries were organized for the benefit of poor children by public-spirited dentists themselves, as in Milton, Pa., where the teeth of the school children whose parents are not in a position to pay for dental services are taken care of, the dentists of the town working alternately and requesting no compensation for the one day a month given to the task; or as in Cleveland, Ohio, where the city buys the material and the Dental Association does the work free for 1500 children whose parents receive aid from the city; or as in Rochester, N. Y., where the Dental Society has a dental hospital and conducts a free clinic under the auspices of the Public Health Association, and in one year examined 622 school children's teeth. It is now using the chart which I had prepared for the National Dental Association in 1900. Outside of the emergency corps of Harvard University Dental Department and the usual infirmaries of the dental schools I have no knowledge in this line as to Boston, not forgetting that a bill was introduced in your legislature to provide for the better care, preservation, and development of the dentures of minor inmates of the public institutions of the commonwealth which had the support of the associated charities, reinforced by the argument of the dentist that "Poor teeth cause indigestion, irritability of the stomach causes a craving for stimulants, and stimulants cause crime"; therefore, in order to repress crime, have dispensaries for dental treatment, regular examination of the teeth of public school pupils, and regulations prescribing the use of the tooth-brush. Both at New Orleans and Louisville dental services

have been tendered through the school superintendents—and refused at Louisville because the school trustees thought the privileges would be abused and that the treatment would “keep business away from other dentists.” Let us hope this condition will not always continue.

Treating diseased teeth of school children at public expense seems entirely out of the question at present; yet, why should it be less reasonable to have visiting dentists than visiting music teachers and drawing teachers and teachers of physical culture? The position of visiting dentist in our public schools would not be a sinecure. There would be work to do every day. The state, however, at once can touch the subject by attending to the question of prevention, as Pennsylvania did in 1906 in granting an appropriation of \$1,000,000 to the Department of Health for its fight against the “white plague,” when it was represented to the legislature that 20,987 lives were sacrificed to seven preventable diseases during that year. If bad teeth could be prevented, the gain to the state and to the individual would be of enormous value, as it is wonderful how many diseases can be traced to bad teeth. During one month a surgeon removed three lower jaws for complications resulting from the extraction of teeth, saying, “We do not see the final results of each other’s work.” One of those cases was for actinomycosis, and one for cancer following a fracture of a fragment of bone when a tooth was removed; another was entire separation of the periosteum from burrowing of pus after fracture of a small fragment of the inferior maxilla. Patients die in hospitals of septic pneumonia, and those who trace it from the original history find many a case that goes on to desperate conditions from the removal of a tooth, because the bacteria at its root were in a state of active proliferation, or violent streptococcus infection follows the extraction of a tooth and erysipelas follows.

The most important argument in favor of the examination of the mouth and teeth of school children is the educational benefit it would be to the community. Is

it not the duty of the schools to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the schools to train people to live better? Is not this the true purpose of the schools? The logical place to begin this is with the physical life of society, the one phase of life that has been most ignored by our educational methods. One result of the more intelligent interest of the people in matters concerning the health of children is the introduction of expert medical inspection into the schools. Thus far this inspection has confined itself largely to the sanitary condition of school buildings and the general health of the pupils. If there has been any specialization it has been examination into the conditions of children’s eyes and ears and perhaps also the nose and throat. One important factor has been largely disregarded, and that is the need of periodical dental inspection. The principal reason for this oversight is probably to be found in the lack of interest on the part of the average physician in the health of the teeth. This field has been left entirely to the dentist, and the latter has not, at least in the United States, been made a member of the medical examiners for schools. Dentists find serious deficiencies that physicians overlook. Of 9080 children examined by the medical examiners of Baltimore within the year, only 136—say $1\frac{1}{4}$ per cent.—were found with defective teeth. In a resolution which I had adopted by the Maryland State Dental Association, the attention of the health commissioner was called to this statement, and contrasted with that of Richmond, where but 65 out of 1173 public school children had no defective teeth when examined by dentists, which confirms published statements that a systematic examination of the teeth of children at home and abroad reveals the fact that from 92 to 95 per cent. have defective teeth. In Strasburg, Germany, out of 2103 children between six and eight years of age examined, 160 had sound teeth, say about 7 per cent.

That parents are primarily responsible for the health of the child is gener-

ally acknowledged, but hitherto they have been made to feel this responsibility only in relation to contagious diseases. The need of the care of the child's health, directly for the child's sake and indirectly for the sake of society, is now being insisted upon by those inaugurating school inspection. The recommendations of medical inspectors are often disregarded by parents, not always because they are ignorant of the significance of the defects and diseases to which their attention has been called. As an editor says, "There seems to be a lack of attention in the care of children's teeth, even in intelligent families, that can hardly be reconciled with efforts made to do for them other things of less importance. We cannot help concluding that parents are not purposely negligent, but have not reached that high plane of civilization which goes with the tooth-brush." It is evident that this phase of school inspection can have but indifferent success unless the parents are interested and instructed in the nature and object of school inspection. In an address before a parents-and-teachers' club in Baltimore, Dr. J. Williams Lord said:

Mothers, for your child's sake, for your own sake, for the sake of the painstaking, patient, persevering teachers of your children, add your influence, your approval, your co-operation by listening to what the nurses have to say and by doing what the school physicians suggest.

Dr. Cronin, who has charge of seventy-five other physicians making an examination of the school children of New York city, where it is claimed that about 50 per cent. of the preventable diseases were spared the children because of the examinations made, told Dr. Bogue, who repeated it at Atlantic City on Tuesday, that he had sent out 40,000 cards to the parents of the children, notifying them that their children were afflicted with diseases of the eye, the ear, the tonsils, or the teeth, and suggesting that these children be referred to their family dentist or physician, and had received 12,000 replies.

The value of parents' associations in many respects is illustrated by the par-

ent-teacher associations in this city and elsewhere. Their aim, as you know, is to bring the home and the school together; to instruct the parents concerning the care of their children. The second object has been carried out by lectures on the physical development of the child. These lectures have proved an efficient agency for giving medical instruction to parents. They have helped the medical inspector in the performance of his duties by making inspection a live issue in the community. In addition to these lectures demonstrations have been given, showing how to care for sick children. No doubt local conditions in some communities require modifications of the plan adopted in Boston, but the general idea of interesting parents in the health of their children at school and at home is worthy of adoption along dental lines. The practical experience of Dr. L. Ashley Faught, a member of the National Dental Association committee on oral hygiene in public schools and institutions, when I was chairman, may be suggestive in opening communication with the public. The Board of Education of Philadelphia approved the plan to give two or three short talks to parents, teachers, and pupils over ten years of age, provided there were no interference with regular work and no cost to the city. Widely separated sections of the city were selected, and Dr. Faught gave the talks. Thousands of posters were distributed. In writing to me of the matter, Dr. Faught said:

The lectures are over, and I have learned much. First, that whoever undertakes this kind of work has to be a very versatile speaker. He has to suit himself to the audience. No cut-and-dried address will do. No reading from notes or papers. Heart-to-heart talks are the only thing. . . . I think the lectures were a success and did some good at least as an entering wedge. The request was made to come again. . . . My opinion of it all is that it is up-hill work, and that the public, both large and small, are at present not much interested in the teeth or their care—at least in Philadelphia.

You will note Dr. Faught's concluding remark, "My opinion is that the public, both large and small, are at present not

much interested in the teeth or their care—at least in Philadelphia.” What is the attitude in Boston, may I ask? I know that you are to have an innovation in your educational system in September by adding to your eighty medical inspectors of schools, at \$200 each, a corps of trained nurses, whose duty it shall be to safeguard the children, serving at the vacation schools as well as through the regular school period, for which the twenty-one women nurses will be paid \$840 each, and the supervisor \$1116; but are these medical inspectors and nurses qualified to report respecting the teeth?

We learn that among children and younger teachers toothache and neuralgia are fruitful sources of absence from school, the teeth being neglected unless the pain becomes unbearable. It is also a fact that children rarely use tooth-brushes. Dr. C. E. Francis says, “Some mouths, so far as the invasion of the tooth-brush is concerned, are unexplored caverns of a miniature type; and others, which receive but an occasional visit from this intrusive explorer, are not in a much better condition for the little care bestowed upon them.” A medical inspector says, “Out of seventy-one pupil-teachers examined in a year, only twenty-five had clean and well-cared-for teeth. The care of the teeth is of national importance, and a teacher who neglects his or her teeth is not likely to teach children that it is of more importance to attend school with clean teeth than with clean hands and faces. It requires to be widely taught that the decay of teeth is due to the growth of septic organisms, and much could be done if only one-quarter of an hour a month were spent by teachers in the instruction of children in the proper value and use of the tooth-brush.” Another examiner among one thousand children found only two who used a tooth-brush. Another says, “A few older children take credit for using a tooth-brush on Sundays,” and out of six thousand children he found only two who had taken advantage of the conservative treatment offered by dental infirmaries. Still another found

caries so general that he contented himself with noting only scholars with more than four carious teeth.

All these examinations were roughly made, merely with a view of getting a general idea of the state of the children's teeth. A much more satisfactory record is that in which the examiners carefully inspected every tooth of two hundred and forty-five children, using a dental mirror and probe, and found that each of these children had on an average 3.9 carious deciduous, and 2.8 carious permanent teeth; 9.3 per cent. had alveolar abscesses or fistulæ discharging pus; 16.3 per cent. chronic pharyngitis; 2.9 per cent. showed chronic enlargement of the tonsils; 61.2 per cent. had enlarged submaxillary glands, and anemia was noted in 37 per cent. Beyond a few instances where teeth had been extracted or broken there was no evidence of dental treatment, and the tooth-brush was practically never used. Only three of the above-mentioned children possessed tooth-brushes, or showed signs of having used them regularly, and these were practically free from caries. It is not surprising, therefore, to learn that bacteriological deposits, tartar, remains of food, and every degree of “malodorousness,” as Carlyle would say, were evident.

The distaste exhibited toward the use of the daily press by practitioners has led to a somewhat anomalous condition. The physician or dentist, who should be a leader and teacher in matters relating to the physical welfare of the public, has, because of this sensitiveness with regard to the use of the press, hidden his light under a bushel, and left the public to grope in the dark; small wonder, then, that the people follow advertising quacks. That following of false prophets which so excites our scorn is in a measure our own sin, for we have kept our knowledge, and not used that great educator, the public press, which is available to us, to impart it. It is the duty of the physician and the dentist to take the initiative in instructing the public. “Dentists today,” says Dr. N. S. Hoff, “know what ought to be done, and it is their duty to force upon the public the knowledge which

they possess, and which makes for the public good"; and Dr. Hoeffer says, "Some Thoughts on the Prevention of Caries" should be read before mothers' clubs instead of dental societies, and it should be published where the greatest number of the laity could read it. Such articles should be printed in the daily papers, and there would be less need of so-called beauty hints as to the care of pimples and facial blemishes."

Last June, after I had read a paper on "Oral Hygiene in Public Schools and Institutions" in the George Washington University, I did not hesitate, except for want of time, on being asked by the editor to write a two-column article for one of the leading local papers, taking the precaution to have printed in the introduction, "I comply with the request of the Washington Post to treat the theme in a popular way, free from technical language." It appeared in the Sunday edition under the caption, "*Dentistry in School*—Dr. Richard Grady Tells of Benefit to Children—To Prevent Decay of Teeth"; and the Baltimore Sun, on a previous occasion (1900), gave two columns to a summary of a paper read at the American Medical Association on "Co-operation of the Public School in Teaching 'Good Teeth: Good Health,'" under these heads: "*A Tooth-brush Drill*—Dr. Grady says it is as necessary as gymnastic exercises"; "*Good Teeth: Good Health*—Suggestions for a systematic examination by competent dentists of the mouths of school children."

There are objections that may be raised to this method of enlightening the public, but they can be, and in some cases have been, met by the appointment of press committees in medical and dental organizations. There is no doubt that many principles of practical medicine and dentistry are now simplified down to the average layman's understanding, and failure to impart these is to default on the lawful contribution to the general good. Particularly is this true: Along the line of hygiene future progress depends largely in propagating knowledge among the people. Chief chemist Wiley of the U. S. Department of Agriculture,

in an address delivered last week, said, "The present generation is going to live much longer than the one which came before, because it knows more about the laws of diet, hygiene, and surgery."

In the past the physician devoted himself largely to the treatment of diseases already incurred, just as the dentist has occupied his time in treating decayed or dead teeth and restoring lost ones, not always associating systemic diseases with their effects upon the teeth, or appreciating systemic lesions due to over-treatment of pathologic conditions of the teeth. "Dentists live inside a tooth," in the words of Governor Hastings of Pennsylvania; or "The dental profession seems most interested in repairing broken-down structures and too little in preventing such conditions," in the words of a distinguished educator quoted by your Dr. Potter. "Somehow, their vision has been limited by the narrow horizon of their special occupation," says Dr. A. E. Baldwin, "and they have possessed little of that large-minded liberality which is the outgrowth of a generous education." "The very title, 'Doctor of Dental Surgery,'" says Dr. E. S. Talbot, if I quote correctly, "has so closely and exclusively limited the profession, as it is called, that the dentist is known to the laity as doctor of the teeth—a man with forceps who can yank out a tooth for a quarter."

But when all this is said by Governor Hastings and others, it must be recognized that the graduate in dentistry is a "trained man," even though he is an educated man with reservations, and no one thinks of calling him a "cultured man." There are dentists, and we know there are many, who do acquire culture, even though it be in spite of their specific education; and there are those who believe with Dr. Black, "The day is surely coming when we will be engaged in practicing preventive rather than reparative dentistry, when we will so understand the etiology and pathology of dental caries that we will be able to combat its effects by systemic medication." There is no doubt that much good would result if we should, much more than has heret-

tofore been the case, educate our patients that the A, B, C of tooth-preservation is cleaning the teeth.

Dr. Guilford says, "I think the dentist in the future will rely upon prophylaxis more than in the past. My own experience and recommendation is to brush the teeth after breakfast, after dinner, and after supper faithfully with an alkaline substance; it don't matter what. There is not one-half or one-third of the caries in a mouth thus treated that you would ordinarily find."

Dr. Truman says, "I am of the opinion, and have been all along, that prophylaxis is to be the main object in the future of dentistry. It won't put money in our pockets, but will put health and comfort in the mouths of our patients."

In the future, then, members of the medical and dental professions should concern themselves with the prevention of disease. They must see to it that intelligent, practical application is made of knowledge for the protection of health. It is not enough, I may mention for illustration, that the work of Reed and his colleagues proved how yellow fever is communicated, or that Miller and Black made discoveries which changed the whole aspect of tooth-decay; physicians must teach the people of the South how they may protect themselves against yellow fever, and dentists must teach what can be done to stop the ravages of decay in the teeth. We want to place particular emphasis on the function of the medical and dental professions in teaching the people in general how diseases are caused and how prevented. This function must be extended. Lectures and demonstrations are needed. Selected physicians and dentists should become popular teachers as well as private practitioners. In this work should be enrolled the intelligent and unselfish practitioners of the whole country. How wide, then, is the field of thought and of action of the up-to-date physician or dentist! His mission is alike to keep out disease and to eliminate its cause, and to spread among the people the knowledge so necessary for their welfare.

"That organization which should embody the very acme of dental scientific thought, the National Dental Association," it is charged by its Committee on Oral Hygiene, in its report read at the last session by Dr. Corley, chairman, "spends at least nine-tenths of its time in the contemplation of the *cure* instead of the *prevention* of disease," and adds, "When we remember that the object of the association is to evolve the highest order of service, we are amazed and chagrined. A conservative estimate would place the number of dentists who give any instruction in oral sanitation, or who require the patients to observe a prophylactic *régime*, at less than ten per cent. The average dental practitioner does not know what a clean mouth looks like. It is not uncommon to have a patient say that his dentist told him that the stains on his teeth were a protection, and should not be removed. It is still more common to hear him say that he has been warned against the too frequent use of abrasive powders, for fear of wearing the enamel off of the teeth; many laymen give the same reason as their excuse for not using the tooth-brush."

These are some of the most pregnant counts ever framed against "the average practitioner" or the National Dental Association, whose code of ethics requires us "to educate the public mind," but the names of the committee are sufficient guarantee of the value of their testimony, and, speaking officially, they must of course be regarded as unimpeachable in their detail of facts. In striking contrast to this indictment in 1906, I quote from a statement concerning the American Society of Dental Surgeons published sixty-seven years ago: "Among the primary objects kept steadily in view by the projector and his professional coadjutors may be alleged—first, THE PUBLIC GOOD."

I feel relieved from the necessity of citing at length to this audience, composed of the highly intelligent in the profession, what knowledge should be imparted, and will in conclusion quote some passages to show that the writers, in my opinion, have spent time in elaborating things not generally accepted by the pro-

fession, and furthermore that they have no particular knowledge or qualifications justifying them to instruct the public in the care of the mouth and teeth. The following vague and inaccurate statements are copied from text-books used in schools, and what the school text-books teach the millions of children in hygiene during the period when habits and practices are formed, in great measure determines their future. As an illustration, one book edited by a person with the affix of A.M. and M.D. to his name gives the following:

The teeth are bony pegs set into the jaw-bones. Those in the front part of each jaw are sharp, so as to bite lumps of food. Those in the back part of the mouth are flat, so as to grind the food to pieces. Between the ages of six and thirteen the child loses its first set of teeth and gets a whole new set and eight additional ones. Through the center of the tooth there runs a small tube which contains a nerve and a blood-tube. The outside, the part above the jaw, is covered with a very hard substance called the enamel, which protects the other parts from decay and injury. Biting hard things, such as nuts and wood, often breaks the enamel and causes the teeth to decay. When the decay reaches the nerve, the tooth aches and becomes very tender.

Another physiology, which has been translated into five different languages, with several hundred thousand copies published, teaches this:

The teeth should be examined, so that if the enamel is removed and decay commences they may be filled with gold foil. All amalgams, pastes, and other cheap, patent articles should be rejected, both for the sake of the teeth and the general health.

The author of this physiology must have heard of mercurial poisoning from amalgam filling!

And still another, a primer intended for instruction of children in the school-room, by "one of the most skilful dentists of the country, enlivened by bright illustrations which children will enjoy," has as its frontispiece fanciful toothache imps at work—long, thin, pointed fingers, each of them an instrument of torture, the thumb and forefinger being pincers and wrench, the middle finger ending in

a pointed awl, the ring finger being an auger, and the little finger a squirt with gnat's poison. It teaches that "Milk is a good food, but it is better for the teeth after it has been boiled than when left uncooked;" that "Our teeth will let us have all the eggs we want, but they like them best soft-boiled;" that "We may have all the fish we want, say our teeth, if we only eat what is fresh and sweet;" that "The pretty, red color of the cheeks and lips of the Irish are due to their habit of eating potatoes;" that "Tartar affects saliva and makes food hard to digest;" that birds eat gravel and sand "to make their food digest;" and answers the question, "Why does a dog keep gnawing his bone after the meat is gone?" by saying, "He does it to keep his teeth clean and strong."

Discussion.

Dr. H. C. MERIAM, Salem. In order to put it in better form, I will, with your permission, read what I tried to quote last evening. This is from Phillips Brooks on the "Higher Battles of Life": "Would you see loyalty, implicit obedience, and the complete acceptance of a law which is supreme? Where will you find them so absolute as in the eager intensity with which the scientist watches the face of Nature to catch the slightest intimation of her will? Would you see magnanimity? Where is it so entire as in the heart of the true merchant, who feels the common wealth surrounding his personal fortunes and furnishing at once the sufficient means and the worthy purpose of his becoming rich? Would you see self-surrender? Its noblest specimens have not been on the field of battle, where the dying soldier has handed the cup of water to his dying foe. They have been in the lanes and alleys of great cities, where quiet and determined men and women have bowed before the facts of human brotherhood and human need, and given the full cups of their entire lives to the parched lips of their poor brethren. We learned during the great war that the heroism of the president might be every whit as great as the

heroism of the general. The enthusiasm of the truth-seeker may be as glowing and unselfish as the enthusiasm which scales the height and captures the citadel with the resistless sword.

"There is nothing good or glorious which war has brought forth in human nature which peace may not produce more richly and more permanently. When we cease to think of peace as the negative of war, and think of war as the negative of peace, making war and not peace the exception and interruption of human life, making peace and not war the type and glory of existence, then shall shine forth the higher soldiery of the higher battles. Then the first military spirit and its works shall seem to be but crude struggles after, and rehearsals for, that higher fight—the fight after the eternal facts and their obedience, the fight against the perpetually intrusive lie—which is the richer glory of the ripper man. The facts of government, the facts of commerce, the facts of society, the facts of history, the facts of man, the facts of God—in these, in the perception of their glory, in the obedience to their compulsion, shall be the possibility and promise of the soldier statesman, the soldier scientist, the soldier philanthropist, the soldier priest, the soldier man." And shall I not also say, the soldier dentist? The "sword is beaten into the plowshare, the spear into the pruning-hook." "The war-drum throbs no longer and the battle-flags are furled." "But it is not that the power of fight has perished; it is that the battle has gone up on to higher ground and into higher light. The battle is above the clouds."

I have nothing to add to this, Mr. President, except to mention a little incident in connection with dentistry that is recorded by one of our historians, who gives an account of the visit of one of our Puritan fathers to the Indian chief Massassoit, whom he found suffering and almost starving in his wigwam. Whereupon he cleaned the mouth of the Indian and administered to his comfort in other ways which so relieved Massassoit that he revealed to the colony a plot for their extermination; so that one of the colonies

of New England was preserved from extermination by the cleaning out of the mouth of an Indian chief by one of our good Puritan fathers.

Dr. H. A. KELLEY, Portland, Me. Dental charity work is a subject in which I am very much interested. Many years ago—in 1896—I was the originator of a dental infirmary for the poor in the city of Portland, which was one of the very first infirmaries we have had worthy of the name. It was established along the lines that are now being followed by the medical profession in their hospitals. That is, men of recognized ability were attached to the institution, and operated on the poor. The clinics at our dental schools can hardly, by that standard, be termed charitable clinics. My study of dental charity work carried me of course to other charity institutions, and led me to make a careful study of sociology, and I wish to sound a note of warning to this society and to the dental profession as a whole. You must consider the subject very carefully before you engage in charity work. It seems, too, that one of the things that is tending to disrupt the medical profession is the prevalence of hospitals. Hospitals to a large extent being incorporated bodies, gather together large numbers of men and tend to crush out the individual. It seems to me that the work that is being done at the medical hospitals is along lines whereby unworthy patients can obtain medical operations at a very nominal fee, if not gratis. Men who are well able to pay the proper fee, one that will allow a medical man to live as professional men should live, are received as free patients. If the dental profession should work along these lines, I fear that the same thing will happen to us. This is of course caused by the fact that so many people take advantage of charity who are not worthy objects of it, and I would especially criticize in these institutions the fact that so much money is spent for operative measures, and so little for the investigation of cases, to determine if they are worthy objects of charity.

Charity work should consist in teaching the poor to help themselves, and that

is what it *must* be. I have been very much interested in reading in the *British Dental Journal* of how much work is being done in England for the establishment of dental hospitals. Now, gentlemen, attack the problem by educating the poor to appreciate the value of sound dental organs. When we can send dentists into the public schools to teach the care of the mouth and teeth we will be doing a noble work. But when it comes to treating infirmity cases, be very careful; go very slowly, and first ascertain that each applicant is worthy of the charity he asks for.

Dr. A. J. FLANAGAN, Springfield. In the first place I want to thank Dr. Grady personally, because many men I know, perhaps, would not thank him for his effort here today. The work he has been doing is a noble one. It is a hard work that in the broad sense has never been appreciated, and it is doubtful if there are any men in the profession immediately connected with the work at Washington and its environments who could really accomplish the amount of work he has done for years. I am afraid that in New England we have not properly appreciated this work.

Dr. Grady made the statement that we should have all the knowledge that medicine can give to dentistry, but it is delightful to find that he himself is satisfied to have only the degree of D.D.S., which Dr. Flagg jocosely called the Degree of Doubtful Skill. He has borrowed of all the knowledge that the world affords to advance his standing and the standing of dentistry, and still at the same time he is satisfied with that degree, knowing that after all it is not the degree that counts, but the manhood and education that go with it. Dr. Grady well knows—and anyone is likely to recognize the fact that he is a student—that the fact of having the degree of D.D.S. does not deny anyone the privilege of going into medicine and other arts and sciences and adding his knowledge and achievements to those of dentistry, yet without having their special degrees.

The question arises as to what is den-

tistry? I wonder how many of the people of Massachusetts have ever thought of what the definition of a dentist is. We have published in Springfield Webster's Dictionary, which is probably credited with being the authority of the vast majority of people in the United States. Now, how many of you have ever looked up in it the definition of the word dentist? The governor Dr. Grady spoke of has well said that the dentist lives in a tooth, and if you don't believe it, go home and get your Webster, and see what it says. It says, "The dentist is one who cleans, extracts, and repairs the natural teeth, and supplies artificial ones." In this enlightened age, if one wants to know what a word means, he goes to the dictionary and relies on it as his authority. The authority of the vast majority of people in this country is Webster's Dictionary, and when you consult it and find that the dentist is nothing but a mechanic, is it any wonder that he is today looked on as a man of partial culture—simply a being who works in a tooth? Now, we have a duty to perform there, and it seems to me that the meaning of dentist could be changed. On the other hand, if you study the meaning of the term stomatology, you will find that the parts associated with the teeth are included in its scope. The average dentist, it is true, does not live outside the tooth, but there are dentists—capable, progressive ones—who are borrowing of all the arts and sciences to do something outside of that mere tooth. That is what we want, and what we must look for.

Dr. Grady spoke about Dr. Faught, a man whom I greatly honor, who makes the statement that teaching should be on the line of heart-to-heart talks. I wonder if it has ever appealed to Dr. Grady or to Dr. Faught that we do not need lengthy papers and cold facts so much as we need heart-to-heart talks; the ability of the professional man to stand in front of a gathering and impart knowledge in a heart-to-heart manner.

I am glad to meet Dr. Kelley today, because I well remember when he came before the Northeastern Dental Society and gave us a delightful paper in regard

to the dental infirmary at Portland. Dr. Kelley has simply given us today the thought that is in the minds of the medical fraternity: that the question of organized charity today is a serious one; that that which pauperizes is not true charity as judged by the standards of the twentieth century, and that the only true charity that this enlightened age will accept is that which leads to an end, but never pauperizes—in other words, is self-help. Dr. Kelley speaks from his own experience, and calls attention to the weakness of charity work.

Dr. Grady speaks of the question of the press. I am afraid he is treading on serious ground, in the minds of many, for the reason that the public press has never been seriously and properly used by the dentist. To my way of thinking, anyone who will read the early history of the world will see that the ancient method of conveying intelligence was by word of mouth. Now, that day has gone by. Oratory is still used, but direct communication from mouth to mouth has gone, and today the press is pre-eminently the means of educating the masses. That being the case, then, has Massachusetts, has dentistry in the United States, done its duty to the public when it has neglected the greatest means of educating the public—the public press? We know that intelligent agitation will accomplish things we have never dreamed of, and agitation in the public press will do wonders. If this state society and other societies had men of ability along that line to prepare articles to be published in the public press as emanating from the society or a committee—thereby eliminating all criticism that might come from individual effort—the papers would be delighted to give prominent space in their Sunday issues; and I say, from experience of association with the press, that the difficulty of obtaining results does not lie with the latter, but with the profession, which does not furnish the proper material for the press to use. No one is to blame but the dentist, and any man who is afraid to advocate a correct use of the daily press is not doing justice to the profession.

Now the question arises as to what we are doing in Massachusetts to benefit the public? In my association of fifteen years with this society we have not done what we might. At the present time this organization stands for the standard of dentistry in Massachusetts. That being accepted as a fundamental proposition in the case, we should supplement it by other thoughts, a few of which I will now mention. First, educate the masses. We have various ways of accomplishing this—the daily press, the societies, and the boards of health. It is hard to find at present in Massachusetts a board of health not having a physician among its members. I would ask you this today: Where is there a board of health or a board of inspection that counts a dentist among its members? Now, gentlemen, the medical profession goes on the broad principle of intelligent agitation. If you can convince the public that there is a demand for something, they are intelligent enough to ask that it be supplied. The trouble is that dentistry has never fully created, through concerted efforts, a demand for public dental services, but as soon as the demand is created, the public will support the movement to organize charitable dental clinics. Many associations gather annually in this state. For instance, the Teachers' Association meets in Boston two or three times a year for the intelligent discussion of advanced methods in teaching. These associations call in clergymen and medical men to address them, but have you ever had that honor given to dentistry? If a dentist were to address these gatherings, think of the good work that would be accomplished in directly reaching the individual student.

Another thought. I wonder if the dental profession of this state has ever thought of the great amount of good that could be derived from public dental libraries. At the present time, in Springfield, the income of a fund created by the will of the late Dr. J. Searle Hurlbut is devoted to the purchasing of dental books for the Springfield Public Library. I have investigated the matter, and find that there has only been one man in

the dental profession broad enough and liberal enough to leave a fund for the benefit of a public dental library. I am going to ask the president to call upon Dr. Hosley, chairman of the library committee, to tell you what is being done in Springfield along that line.

Dr. H. E. Hosley, Springfield. The movement that has been inaugurated in Springfield is only the beginning of a movement that will be taken up by the dental profession throughout the United States. It will be brought eventually to the attention of the profession by editorials in the different dental journals, and if the inner circle in dentistry is thereby induced to take an interest in this movement, I believe that it will be brought to a successful issue throughout the United States. This movement will bring together the dental and the medical professions for their mutual benefit. It will educate the people in dental matters. The public needs this education, and if it becomes aware that the dentists have a library where they go for study, that in itself will be a wonderful example. That we go there to study will modify the opinion prevailing in the medical profession that we are not students. Perhaps not all of us are, but there are just as active students in dentistry as in medicine, and they will accomplish just as much as the medical profession has in the work of organizing special libraries. The establishment of this library in Springfield is yet in an embryonic state. At Columbus, Ohio, the state society has subscribed five hundred dollars to a fund for this purpose, and they immediately purchased a library. Now, that shows that the West fully appreciates the need of such a movement, and its social side will prove of great importance. We have dental libraries in a number of places, but they are simply books placed upon shelves, where any dentist can go if he happens to know about it,—which the great majority do not. Now, if there is a room where we can rub shoulders with the medical profession, you can readily see what it will mean to us.

Along the line of education, there is no doubt that we have been neglectful of our duties, and I think the matter is about to be taken up. It is only a question of time before the dental profession will realize that the public needs this kind of education. It is a case of pulling together in the harness to bring about this end. I think the state dental societies and the city dental societies are representative of the best class of dentists in all parts of the country, and it would seem to me that there is a large field for work along the lines of public education by the preparation of articles for magazines, and especially for the local papers, under the supervision of these societies. We also have the opportunity for individual education in our own offices. I want to say that this dental library movement is one of the greatest opportunities that has ever been offered to the dental profession. I hope each one will take the thought home with him, consider it carefully, and lend his help to bring it to a successful issue. It can be done, and you will be amazed at the support the dental profession will give you in this movement. The enthusiasm of the dentists in Massachusetts, and especially in Springfield, is carrying the movement to a successful issue—almost like water rolling over a waterfall, you cannot stop it. Let this enthusiasm be carried to every place, for it is a work which means as much to the public as to the profession.

Dr. NEWTON MORGAN, Springfield. I think that in order to accomplish palpable results we should take a conservative course. In the specialties there is a tendency for men to devote themselves so exclusively to their particular field of work as to lose sight of other equally as important regions of the body. In other words, the man who makes a specialty of dentistry must save the teeth, regardless of the rest of the body. The other specialties tend along the same line. We need to conserve the whole body, not the teeth alone, and if we cannot get the profession or the public to come up to the point where we see they ought to be, we must work on until we can lift them up

to it. All this discussion is along the right lines and will help to induce us to work in our offices to bring about these results.

I have been thinking much recently in regard to prophylactic treatment of the teeth and the correction of irregularities, and it seems to me that although these are necessary measures at the present time, our work should go greatly beyond that. We should study the phenomena of nutrition, and the surrounding influences that go to make up a perfect body. We know the need for such a course of study, and in the course of years, through the process of human evolution, man's duties will be performed properly and in such a way as to preserve the teeth and body in perfect condition.

Dr. GRADY (closing the discussion). I do not know whether Dr. Kelley is aware that I wrote an article on the use and abuse of dental charity by dental infirmity patients. The paper which I read before the American Medical Association was made the subject of leading editorials in the *New York Medical Record*, the *London Lancet*, and one dental journal at least attacked me quite severely. The *International Dental Journal* had a four-page editorial in review of the article, saying that criticism, being disarmed on the old lines, has begun an open attack on the internal management; that it never has been shown or acknowledged by the colleges that they were charitable organizations, etc. I had looked into the matter of fees charged in these clinics supposed to be for charity, and I found that there were colleges getting more money out of the infirmaries than many men were getting in private practice; in fact one openly acknowledged "making charges a little higher than those ordinarily made in offices." The plea of another college was, "We can't afford to lose by our good works."

So far as the library goes, we have one in Baltimore which was organized some years ago in connection with a free library. I got up a list of reference dental books for the library and they were pur-

chased, but I do not think that many dentists or dental students know that the books are there.

Respecting opportunities, I am glad Dr. Flanagan looks at it that way. In the *June Cosmos* there is a paper written by me, in which I have asked the question, What are we going to do? I say what I am doing, and ask what are you going to do? The *Evening Star* of Washington asked me if I would not put one of my articles in popular language for publication in the Sunday issue, and I did not hesitate to do it. I said in the body of the paper that the editor had asked me to do so, and in that way the article showed on the face of it where it came from and what it was. That is the thought I brought out today with regard to our educating among parents, teachers, and associations. Of course Massachusetts is the birthplace of these teachers' associations, and I think you have five here. The medical inspectors go to them and talk to the parents and teachers of their work, and give their support in this way. Now, why could not something like that be done by the dentists? It is not an unusual thing for teachers to be addressed by dentists. This is done down South, where they address normal schools. They are not only invited to address these bodies, but their expenses are paid.

With regard to orthodontia, mentioned by the last speaker, I came here direct from the American Medical Association, where I listened to a paper by Dr. Bogue read to the medical men, showing that we can begin that work at six years, and those of you who are familiar with the literature of the Fourth International Dental Congress remember a paper published in the report of that congress showing a case in which orthodontia was begun as early as three years of age by Dr. Davenport, dealing with his own son. It seems to me that parents and nurses should be properly instructed; thus, with the infant in her lap, the mother will be able with finger force to bring the teeth into line.

Dr. KELSEY of Baltimore then spoke to the society with regard to the James-

town Convention, urging a large attendance of the dentists of Massachusetts.

The next order of business was the report of the Committee on Dental Medicine.

[This report was published in full at page 1181 of the November issue of the Cosmos.]

The next order of business was a lantern talk by Dr. CHARLES A. PORTER, Boston, on "Oral Surgery."

Dr. Porter showed a number of slides illustrating conditions in the mouth which probably could have been avoided if they had been early diagnosed. Most of the slides were of cancer cases which had been allowed to advance so far that radical surgical measures had to be adopted in order to check the ravages of the disease. He urged the importance of the dentist's being able to recognize these conditions, as a great many of such cases come to the notice of the dentist before the attention of the surgeon is called to them. Among other conditions he showed a case of actinomycosis in connection with alveolar abscess. He also spoke of operations for hare-lip, and showed many slides illustrating the results obtained thereby.

Dr. MAXFIELD moved that a vote of thanks from the society be extended to Dr. Porter for his talk.

The motion was carried.

Motion was then made and carried to adjourn until 3 o'clock P.M.

Afternoon Session.

The meeting was called to order at three o'clock, by the president, Dr. Smith.

The first order of business was the reading of a paper by Dr. FREDERICK P. GAY of Danvers, on "Preventive Medicine."

[This paper was printed in full at page 1136 of the November issue of the Cosmos.]

Discussion.

Dr. H. C. FERRIS, Brooklyn, N. Y. I enjoyed the essayist's paper very much

indeed; it is extremely scientific. The information he has given us and the experiments he has described are certainly the results of lengthy research. I hope the specialists in this line of work will eventually be able to make pure cultures of the specific organism, for until that organism is obtained in pure culture, reports such as this can hardly be accepted in the light of scientific facts.

Dr. BROWN. I would like to ask the essayist if there is any pathological symptom, sign, or indication by which we can determine for a certainty the presence of the disease in the mouth.

Dr. GAY. The presence of the *Spirocheta pallida* unquestionably demonstrates the disease. That the disease is caused by this organism is vouched for by the overwhelming evidence of the constant occurrence of this organism in syphilitic lesions.

Dr. HOSLEY. I would like to ask if there are any suggestions that the essayist may be able to put before the dentist that would help us in recognizing oral syphilitic manifestations. His experimental work must have led him into the field of diagnosis, and the results of this should be of great help to the practitioner of dentistry, therefore I would like to hear his ideas with regard to diagnosis of these lesions in the mouth.

Dr. SMITH. I may say that Dr. Gay is a laboratory man, and I am hardly inclined to think that he comes in contact with the lesions in the mouth as much as the surgeon or physician.

Dr. GAY. I do not know of anything I could say beyond those things which are known to you. I would rather defer to the judgment of any of you here, because you must have seen such lesions frequently. The clinical aspect of the disease has not interested me primarily, as my work is entirely in the laboratory. Of course, all of you must have seen these lesions, and the more you see, the more readily you will be able to recognize them. A correlation of the symptoms would lead you in many cases to a diagnosis, but the demonstration of the spirocheta, which can be obtained in a perfectly characteristic manner from the

secretions, unquestionably leads you to a diagnosis of the disease. I have a photograph here which shows these spirochetæ in a chancre, which enables you to see how they appear in smears.

Dr. DONNELLY. I would like to ask what method of staining we should use to develop the germ so that we could recognize it.

Dr. GAY. The method of staining with silver nitrate has been used in sections of congenital syphilis, but that of course is different from the methods applied to the staining of smears from mucous patches, and the Giemsa staining method is the proper one for the latter.

Dr. H. E. KELSEY, Baltimore, Md. The paper interests me very much—from the fact that I come in contact with this disease in the college clinic more frequently than is possible with those in private practice only. While many of the patients sent to us from the hospital are given a little slip stating that they are suffering from syphilis, we have often detected the disease in patients who did not present such a slip. We in the infirmaries come in contact with probably ten times as many cases as do those in private practices, and very often patients come to us before going to the hospital, and then, too, they frequently come from the hospital and do not present the slip showing that they have syphilis. When the symptoms are well developed the disease is manifest and fairly easy to detect, but in many cases it is very difficult; consequently I think it is extremely valuable to us as dentists, and also to any other specialists, that a method has been developed whereby the diagnosis may become quite certain.

Motion was made and carried that the society extend to Dr. Gay a vote of thanks for his excellent paper.

The President announced that the next order of business would be the reading of a paper by Dr. V. H. JACKSON, New York, N. Y., on "Orthodontia and Orthopedia of the Face."

[This paper is printed in full at page 1262 of the present issue of the *Cosmos*.]

Discussion.

Dr. A. L. MILES, Cambridge. I would ask the essayist if with this appliance he can expand the arch and the alveolar process without tipping the teeth.

Dr. JACKSON. I can do it better with this system than with any other method I have employed. I explained in my earlier writings that when the upper arch is expanded too rapidly the ends of the roots of the bicuspid and molars are sometimes forced over the true bone of the alveolar sockets, especially at the location of the malar process, and that this movement usually results in elevating these teeth. The true bone of this region projects downward more over the roots of the teeth. As it is not absorbed as readily as the alveolar process, it forms a barrier which tips the teeth as they are moved. This is one reason for the early regulation of the teeth before the maxillary region is fully developed. To prevent tipping of the teeth the apparatus should be made in such a manner that the teeth can be moved bodily, and I know of no appliance that is so easily manipulated.

There are several methods that can be resorted to in order to prevent a tooth from tipping when expanding the arch in the molar region. One of these consists in cementing to the tooth a collar having on the buccal surface a slight lug to engage the spring clasp of the appliance. One reason for not tying the apparatus to the teeth by the methods generally employed is that it permits of a vacillating movement, which causes intense inflammation. We should prevent inflammation while inducing a mild degree of irritation by the application of constant and definite force. We want to induce the development of the jaw and it is necessary that the tissues be stimulated, but if this stimulation be carried to the point of inflammation, the desired building up of tissue will not take place. If it be intended to obtain a greater incisal space through lateral development of the jaws, it is well to obtain it early and before the bone has become dense.

Dr. JOSEPH T. PAUL. What success do you have with patients over twenty-five years of age?

Dr. JACKSON. There is no special difficulty in moving teeth at any age. Care should be exercised in not applying a force that is vacillating, and in the case of adults, the teeth should generally be retained in position for a long period. Dr. Kingsley took the ground that the arch did not need to be retained long after expansion. From my experience, the arch after expansion usually needs to be retained for a long time. The wearing of a retaining device for several years is in some cases advisable.

Dr. PIPER. I would like to ask if you would attempt to regulate the teeth of a child, ten years of age, who has erupted the permanent centrals and lateral incisors, but still retains the deciduous canines and molars?

Dr. JACKSON. I often begin earlier than that period. I have casts of the mouth of a child whose arch was expanded at four years of age. We should as a rule begin the expansion while the arch is in the developmental stage, in order to obtain the best results. You will remember that many years ago I recommended the placing of the teeth in their proper position while erupting, or as soon thereafter as practicable. We know that the permanent teeth are larger than the deciduous ones, and their wedging during eruption encourages normal development of the jaws. Sometimes the deciduous teeth are prematurely lost, and the permanent ones not having sufficient space are late in erupting. I believe in assisting nature by applying slight but constant force, in order to provide room for the erupting teeth when there is insufficient space in the arch. The expansion should be at the anterior or lateral regions as may be indicated by the nature of the case under treatment. The deciduous teeth should be filled and kept in place until the time of eruption of the permanent ones.

Dr. SMART. I would like to ask if there is not danger of injuring the enamel where these appliances are worn so long?

Dr. JACKSON. That depends on whether the rules of prophylaxis have been observed. We know that in a few cases where people have worn artificial dentures with clasps about the teeth for a considerable length of time, the enamel has been injured, but it depends largely on cleanliness. There should be no motion of the appliance, and if it be adapted properly there will not be any. I have been embarrassed in a few cases where the patient has become careless and not followed my directions in cleaning the teeth. There should be no injury to the teeth where the appliance is removable, and the teeth and appliance can be easily kept in a prophylactic condition.

Dr. C. W. RODGERS, Boston. I think that Dr. Jackson's system for the correction of irregularities is the very best that has been given to the general practitioner. Almost every one of us has been and will, at times, continue to be called upon to do some regulating, and to such of us as have not made a special study of orthodontia, the use of many appliances for the correction of certain irregularities has been the source of considerable worry. I know that to me, at one time, it seemed an impossibility to even think of using the intermaxillary elastics for equalizing the jaws. The operation was beyond my capability entirely. Since using this system of Dr. Jackson's—the humane method—the use of the intermaxillary elastics has become one of the more simple operations in my practice. I would not hesitate now at the technique of this operation any more than I would at the insertion of a gold or cement filling.

Some time ago, a regulating case came to me, and in my ignorance I took charge of it, telling the patient and her mother that I would do it. I showed the casts of the case to one of the best orthodontists in the country, and he said it was one for a specialist—that a general practitioner had no business with the case. I went to New York shortly afterward and had an interview with Dr. Jackson. He explained how he would regulate the case by his method. I had confidence in Dr. Jackson and his method, used the

appliances which he recommended, and the case has gone along very successfully. It has been most encouraging to me, as a general practitioner, to delve into the field of orthodontia since using Dr. Jackson's method, and I thank him for it.

There is one thing that the essayist spoke about which, I think, cannot be emphasized too strongly—that is, the matter of making the tracings of the appliance on a chart, with a dot or tracing to indicate the desired distance to move the teeth, bending the appliance to conform to the new tracings. This should be done at each visit of the patient, and the appliance should not be bent unless the tracings on the chart have been made first. One of the defects of this system is its simplicity, and when we see how easily it works, we are very apt to become careless and forget this very important feature of Dr. Jackson's method. The only trouble I have ever had was due to my neglect of this matter; so I advise you particularly to be conscientious in this feature of the work. I advise those who intend to take up this method to start in with a simple case. If you cannot at first make the appliances, have them made for you. There is a gentleman in New York, a former assistant of Dr. Jackson's, who makes these appliances for the profession. Have good casts and send them to him with your instructions, and he will make any sort of a Jackson appliance you may want. After you have treated one case, I know that you will become thoroughly enthusiastic over the system.

One feature that has been particularly pleasing to my patients and myself has been that of being able to accomplish so much in a comparatively short time and without the infliction of pain. This fact did not impress me very much at first, but patients have told me repeatedly how friends who have had their teeth regulated have insisted that intense pain must accompany regulating operations. This system, being painless, is properly called the "humanitarian system."

Dr. D. HURLBUT ALLIS, Springfield. I want to speak in favor of the system which has served me so well. I have a

case, which I will show in the clinic tomorrow, carried through under the Jackson system, and which was begun at the early age of six years, and I will show the work completed at fifteen—one of the most beautiful sets of teeth you ever saw. This work was done—as Dr. Rodgers says and as Dr. Jackson claims for his system—with practically no pain to the patient, and with perfectly sanitary conditions in the mouth during the course of treatment. These appliances can be cared for as easily as they can be adapted. They can be made to look as good as new in a few minutes by polishing or plating them. One of the great benefits of the system is that the work is carried on with little pain and without disturbance of the health of the patient. We must realize that as a rule this work is done for patients in the developmental period, who are using nearly all of their vital force to obtain the proper growth, at the ages of from six to fifteen. These ages are those at which the patients must be handled very carefully so that their health and growth will not be disturbed. It is astonishing with how little pain and with what little pressure we can straighten these irregular teeth by this system, and I for one am very thankful to Dr. Jackson for what he has presented to us in the way of practical removable appliances which we can use so easily and so effectively with our patients.

Dr. ALLEN. I would like to ask if Dr. Jackson advocates the idea of the general practitioner's attempting regulating work with this system.

Dr. JACKSON. I have for a considerable number of years claimed that every general practitioner should have a knowledge of orthodontia. This system is such as to permit one to look after a considerable number of patients without consuming an excessive amount of time, the appliances being made and fitted to the casts in the laboratory. At first one should regulate only simple cases. I would not recommend attempting a complicated case at first with any system. My purpose in orthodontia has been to get rid of the disagreeable features, and I am still working along those

lines. I have presented methods today that I did not present two years ago. I have tried them well and know that they are an advance in this line of work. With my system, the general practitioner, if he be willing to master the technique of the appliances, can do regulating painlessly and effectively.

Dr. ALLEN. I agree with you, but the average practitioner does not have the same opportunity for practice in this work as the specialists, and therefore it is difficult for a man with a small practice to know as much of orthodontia as he does other branches.

Dr. JACKSON. In the first place, a man should not attempt to practice orthodontia without he has a level head and has acquired mechanical skill. He should know what he can accomplish for the patient. What I fear now is that the advertising men will take up the system and advertise it. When they know its advantages they will not hesitate to tell the public that they can regulate teeth painlessly, when it would not be ethical for the general practitioner to make such a statement in a public way. Gentlemen, this is the humanitarian method, and when the public know the benefits to be derived from it, they will not permit the use of some of the painful methods now being employed. By my system of appliances and record-chart, orthodontia is reduced to an exact science. There is no reason why any man who is willing to apply himself to its study should not be able to use it successfully, with much benefit to himself and to his patients.

Dr. RODGERS moved that a vote of thanks be given to Dr. Jackson for his very valuable paper.

The motion was carried.

Motion was then made and carried to adjourn until Friday afternoon.

THIRD DAY—*Afternoon Session.*

The meeting was called to order Friday afternoon by the president, Dr. M. C. Smith.

There being no further business be-

fore the society, the president announced that the installation of officers would be the next order.

The President appointed Drs. Kinsman and Freeman to conduct the newly elected president, Dr. G. A. Savage, Worcester, to the chair.

The retiring president, Dr. SMITH, in presenting the gavel to Dr. Savage, said: Dr. Savage, I think it is the happiest moment of my life, when I can pass this gavel over to your care for the coming year. I hope that your officers and first vice-president will assist you as nobly in your work as you, as first vice-president, have assisted me. Had I been allowed a little more time in presenting my annual address, I should surely have recommended to the society that the annual address be presented by the ex-president after he has had the year's experience in office. The workings of the society after one has served a year as its president look entirely different from what they did before assuming the responsibility of that office. I would not have you think for a moment that I am trying to take any honors from your office by wanting to write the address for next year, because I know that you are competent, able, and willing to administer the affairs of the Massachusetts Dental Society for the coming year.

Dr. SAVAGE. I thank you, Dr. Smith, for all the kind things you have said. I thank the society for the honor which they have bestowed upon me, and shall certainly try to do my duty. With the aid of the members—I am sure that the first and second vice-presidents will aid me—I hope to prepare a good meeting for next year. I shall try and do my duty in every way. This has been a strenuous year for many of us, as we have done our best to make this a good meeting; I think it has been a success.

I want to assure Dr. Smith, the retiring president, of my appreciation of his very admirable address, and only hope that I may be able to write such an address as he has presented to you.

There being nothing further before the society, motion was made and carried to adjourn until the next annual session.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-ninth Annual Meeting.

(Continued from page 1197.)

FIRST DAY—*Afternoon Session.*

(Continued.)

THE next order of business was the reading of a paper by Dr. EUGENE S. TALBOT, Chicago, Ill., on "Acid Auto-intoxication and Systemic Diseases the Cause of Erosion and Abrasion."

[This paper is printed in full at page 1225 of the present issue of the COSMOS.]

Discussion.

Dr. JOSEPH HEAD, Philadelphia, Pa. The subject of Dr. Talbot's paper is of very great importance, and one to which we cannot pay too much attention. Three or four years ago I carried on some tests on the effect grits in conjunction with tooth-brushes would have upon the teeth, and I found that erosion or abrasion grooves could be absolutely reproduced in teeth out of the mouth, with brush and a grit powder, as we find them in the mouth. In plain words, I found out conclusively that while there is chemical erosion, there is every reason to believe that mechanical erosion with the tooth-powders is largely responsible for the characteristic grooves that we so often find around the necks of the teeth. This was particularly interesting, owing to the fact that it was on the front teeth that the grits made the grooves, and that in the third molars the latter were wanting. I have yet to find a third molar grooved at the neck as we find the other teeth, and for that reason I should like to ask Dr. Talbot if he has ever found this particular smooth groove on the back or side of such a tooth. [Dr. Talbot shook his head.]

Since he has not, it would seem that

erosion is chemical dissolution that may be combined with abrasion. About three years ago I endeavored to find an acid in the mouth that would attack zinc oxy-phosphate with the same eagerness that it would the enamel, and am still searching for it. All the known acids of the mouth I have tried in various solutions, and find that they invariably attack the enamel of the tooth more readily than they do the cement. But while failing to discover the acid that would attack cement and not the enamel, I became interested in the action of acids on the tooth, and was very much helped in this direction by the work of Brubaker, which was presented in 1894, in which he showed beautifully that suboxidation and the piling up of carbon dioxid in the blood was apt to be associated with the presence of acid sodium phosphate or acid calcium phosphate in the saliva. Later on the action of this acid calcium phosphate was studied by Dr. Kirk in a most interesting series of articles. First, he worked it out synthetically by knowing what salts he expected to find in the mouth. Second, by dialyzing the saliva he succeeded in demonstrating the undoubted presence of acid sodium and calcium phosphates. Through this we had a fundamental practical basis upon which to start. I have given much attention to the action of acid sodium phosphate and acid calcium phosphate, and back of the action of the acid sodium phosphate is the fact that it will attack the surfaces of the enamel, and as it does this, it at once deposits the basic salt, making a smooth glaze-like appearance on the surface, and with one or two minor exceptions it has been the only acid I have found that ever attacks the

surfaces of the enamel and gives the characteristic glaze that we find produced ordinarily, according to our supposition, by the tooth-powder and brush. Now, the presence of acid sodium phosphate and acid calcium phosphate is very difficult to determine. They are found in the urine and in the saliva.

This paper of Dr. Talbot's is most interesting and suggestive, yet I cannot but feel that it is more suggestive than conclusive. He takes the litmus paper, puts it in the mouth, and examines it for acidity just as it is withdrawn. If the litmus look red the saliva is probably acid; if it be blue, however, it may not mean that the saliva is not acid, but simply that he has missed the acid. We frequently find that to be the case, and I think if Dr. Talbot hereafter, when making tests with litmus, will dry the paper, he will find in many cases that the supposed neutral or alkaline reaction is in reality acid. So I should feel, under these circumstances, that the tests or the data on which his conclusions are based are faulty.

Now, there is another point. This acid sodium phosphate, as I said before, is a very subtle salt to find. Take for instance Sutton's "Volumetric Analysis," which says that saliva that was neutral to litmus frequently showed an alkaline reaction to lacmoid or Congo red, and at the same time it may show acid to turmeric paper. We may take two samples of the same saliva and one may turn blue litmus red, the other red litmus blue. Let us see what effect small quantities of acid may have upon the teeth. I have found in a course of recent experiments that one part to twenty thousand of acid sodium phosphate will cut the tooth more rapidly than a watery solution of one to twenty parts, and yet this one part to twenty thousand does not show on litmus until dried, and weaker solutions may not show at all. Now, in every one of the cases Dr. Talbot mentioned, he cannot, unless the litmus is dried, say that there is no acid sodium phosphate present, and litmus is such an ineffective reagent with these acid salts that I doubt if he has any real data on the subject.

Dr. Truman, while using the litmus tests, I think admits that they are crude, and says that our tests concerning the alkalinity of the mouth will have to be revised. Every test for the last fifty years is practically untrustworthy, and until somebody can give us some really simple test by which we can prove whether this acid sodium phosphate in small quantities may be present, and that other acids of similar nature may be present, I think we shall have to admit that we are hopelessly in the dark. Now, I do not mean to say that there is not a great deal to be said in favor of what Dr. Talbot mentioned, but if he feels that by means of the litmus he is able to diagnose cases, and tell just what is the matter and what is going to happen to that patient, I feel, as far as I am concerned, that we are leaning on a very weak staff.

I want to say that Dr. Talbot is correct in his treatment of these acid or gouty conditions. His remarks in this field are not to be criticized; only I do not think there is any one very effective diet list. If you will examine the diet lists of twenty or thirty eminent physicians, you will find that pretty nearly everything is excluded, and the conscientious patient would starve. In other words, while these diet lists are very scientific, I think it comes down to the fact that you must give the patient that which will agree with his individual case. And so outside of his diet list it seems to me that Dr. Talbot's remedy is reduced to examining the acidity or alkalinity of the urine. That is a wise precaution, but of itself will hardly lead us to a universal panacea for the cure of erosion.

However, I wish once more to congratulate Dr. Talbot on his paper, as this subject cannot too often be brought to the attention of the dental profession.

Dr. M. L. RHEIN, New York, N. Y.
The type of disorders discussed by the essayist I have studied in my limited way for a great many years, and it was gratifying to me to listen to the statistics and clinical results that have been read by Dr. Talbot, as they confirm almost en-

tirely the results that I have, at various times during the past fifteen years, published to the profession. His paper especially bears out the results of a paper of mine, which I read before the Odontological Society of New York in 1896, on the oral expressions of malnutrition. At that time I gave a *résumé* of a number of cases of systemic diseases illustrating the various forms of oral expression that such diseases would manifest, and I chose for the purpose cases from my own practice. Therefore it is a pleasure for me to be able to entirely substantiate in my limited way all of the essayist's assertions in regard to the detrimental effects upon the tooth-structure and the surrounding tissue of anything that will affect general nutrition. I am heartily in accord with his statement that because these are end-structures and transitory structures, similar to the nails and hair, the first symptoms of malnutrition in any form whatsoever will manifest themselves in what may be termed the dental structures. In that paper I also called attention—and I cannot find any other published document making this particular assertion—to the great similarity between what the author chooses to call interstitial gingivitis and the various forms of erosion and abrasion resulting, separately and combined, from these same diversions from the normal. They have always to a great extent been classified and looked upon as due to different causes, and I am pleased to have seen the essayist group them together in the way that he has. So that so far as clinical observations go, I am thoroughly in accord with the author.

He has, however, in his paper today, presented a phase of the reading of these conditions of the system that is entirely at variance with accepted pathology at the present day. It would be absurd for me, because I do not personally agree with this presentation of the essayist's view of pathology, to dogmatically deny its correctness. But it is important, before we accept any such new pathological doctrine as this, to be sure that the steps which have led to these deductions are correct, and they will have to be properly

substantiated. In the paper as presented to us the author has failed to offer any distinctive proofs of the correctness of his deductions. In the first place I agree with him as to the important bearing on this subject of the fact that the several forms of erosion differ in their outward manifestations. They vary very greatly, and the study of these variations is in its infancy. These forms, speaking from clinical observations, differ according to the nature of the abnormal state of the individual, and if you stop to consider what this means it will bring to your attention how varied can be the symptoms, because that is all that the erosions are—a symptom of an abnormal systemic condition. Recognizing fully that urine analysis will faithfully show any existing serious digression from the normal, I cannot place much importance upon any form of urine analysis as a diagnostic aid in determining the exact disease producing the pathological symptoms. For this purpose I believe urinary examinations to be the most useless form of examination that we have in general medical diagnosis. This opinion is the result of very careful study of a large number of serious cases. Let me try and make the point clear by citing a series of cases which I started to illustrate in the paper that I read eleven years ago. I there mentioned the case of a cousin of Dr. Ottolengui's. The patient was brought to me for consultation at that time by Dr. Ottolengui on account of the loosened condition of the teeth, and notwithstanding that they had been tightened by Dr. Ottolengui, there were notwithstanding repeated recurrences of the disease. I made a diagnosis, entirely from clinical appearances, of Bright's disease. Her physician, who was a man of great reputation in New York, was surprised, because he had been trying to find out the trouble with the patient but had failed in his urinary examinations to come upon anything that would evidence any form of nephritic condition. It was only much later after repeated examinations that finally, in the graver conditions of the disease, casts were

found, and my diagnosis was corroborated. The patient died shortly afterward. This case is the parallel of many cases of Bright's disease which I diagnosed as such, and in which for some years all possible urinary analysis failed to corroborate the early diagnosis.

Only this week a dentist in New York, Dr. Geffers, came to my office—I would first say that I like to bring out a case that you can all substantiate—came to see me in reference to the condition of his own gums. It seems that five years ago Dr. Geffers brought his wife to me for this same purpose. I made a mouth-diagnosis of Bright's disease in her case at that time, and told him that local treatment attempted under these conditions, no matter how efficacious or how efficient, would be unavailing unless the nephritic condition underlying her trouble was understood and could be combated. He went with my story to his physician, who pooh-poohed it. Impressed by what I had said, Dr. Geffers left his physician and consulted another. In short, his wife's mouth was under treatment in my office from early fall until March, and during that time half a dozen physicians examined the case and all pooh-poohed the diagnosis of Bright's disease. Finally, the case left my hands and it was not until within a week that I again saw Dr. Geffers. The first thing I asked him was regarding his wife, and he said, "Did you not know that my wife died four years ago? I took her to Europe and no physician there was able to understand her condition or to substantiate your diagnosis, but when we returned to this country a diagnosis was finally made of Bright's disease, and she died shortly afterward." Now this is a startling presentation of facts in connection with this subject and it is for that reason that I have mentioned names, because I want you to realize that I am not theorizing. It means that these end-organs in the mouth show the very first symptoms of malnutrition or general organic derangement of any kind, and if it be true, as I have always asserted, it means that our importance as diagnosticians, as brought

out by the essayist, is of utmost value to humanity at large, because in a great many of these diseases the early diagnosis means much. But it is on this account that I value very little these urinary examinations, because, especially in the early stages, the general symptoms of abnormality of many organs are transitory. The urine shows what the kidneys excrete at certain times. If they are acting normally, and if the patient obtain the proper rest, treatment, or diet, whatever it be that is needed, then the disease is absolutely obliterated so far as diagnosis by means of the urine is concerned, and therefore for some years I have valued most highly the work of Dr. Michaels of Paris, because I believe that there rests the greatest secret of real diagnosis of all digressions of organic conditions. Urinary analysis will always retain a place in diagnosis, but it will be one of corroboration of other media.

Turning once more to the peculiar pathological dogma of the essayist, there are a number of features that are at variance with accepted research work. He has placed great importance on the renal conditions, and the inability of the liver to take care of these acid conditions under certain circumstances. Ponfick, in some very extensive investigations on this subject, has demonstrated over and over again that two-thirds of the liver could be absolutely removed in animals, and still there would be sufficient substance left for the normal functional action to take place. I simply desire to bring out these conclusions adverse to the essayist's statements, in order to make the point of my objection to accepting new views on the pathology of the diseases in question until more accurate data become available. That is to say, the author tells us of the possibility of the blood being acid. While I am willing to agree to it if it can be proved, our present views show us that life under such conditions is impossible.

Now, I was very much interested in some of the statistical cases introduced by the essayist. He spoke a number of times about the occurrence of erosion in pregnant women, and claimed it to be

due to the abnormal retention of acidity. These conclusions are entirely in accord with my own observations, especially in those women who bear children in rapid succession; in those cases the evidences of erosion—of uncontrollable erosion—are most marked. When I say uncontrollable, I mean that in spite of the greatest pains being taken by the patient to keep the mouth in a prophylactic condition, and of frequent visits to the dentist, the erosion still goes on. My deduction is that these pregnancies, following so rapidly, have been such a strain upon the physical being of the woman as to induce a condition of malnutrition for both the woman and the fetus. This at once affects the nutrition of the mucous follicles, and the erosion is due entirely to what may be called the abnormal condition of the mucous follicles as the result of lack of nutrition to these parts. Now, let us try to prove this theory by taking up seriatim our reasons for success in the treatment of erosion. The special care which we give to the mouth to obviate erosion, our constant massage of the gums, and constant toning up of the local parts, is the reason why it is beneficial. It is because this mechanical treatment and keeping the parts free from bacteria result in toning up and forcing arterial blood to these parts in a condition that the natural force of the arteries would be unable to do. In this manner we drive blood into these localities and bring a nutrition which ought to obtain normally, but which would not go on in such a lowered condition of the system, and as a result the pathological state of the mucous follicles is changed to a normal condition. If this pathological inference is agreed upon, it naturally proves the correctness of my views on the etiology of erosion. Let us, however, not forget that there are cases when they become so serious that all the prophylactic treatment that can be given them is of no avail to prevent the spread of erosion or interstitial gingivitis.

In closing my discussion I want to bring this particular point to the attention of the essayist: In the present day, in research work, in order to

demonstrate the correctness of any such assertions as the essayist has made, it is necessary that they should be backed up by proofs, in the shape of sections of the various organs involved. I mean by that, the pathological conditions of the liver, kidney, and different organs affected must be shown by specimens of these organs thoroughly examined under the microscope.

Dr. F. L. FOSSUME, New York, N. Y. I wish to congratulate the members of the society on having had the opportunity of listening to the paper just read. I cannot help but support it. Dr. Talbot has given his unbounded energies toward placing dental thought on the proper basis. It is quite impossible to understand how conditions tested in the mouth can possibly differ from pathological conditions in other parts of the body, and inasmuch as the whole thought of this paper has been to place the study of the etiology of dental diseases of the mouth and its organs on the same base as that of diseases of other regions of the body, I think that the dentist will be compelled to employ the same diagnostic means as the physician. The most important and reliable means from which the physician can make diagnoses today is through urinalysis. When the urine is disordered, it is easily traced by clinical experience to the seat or source of the disorder. It is not only the acidity of the urine that must be considered, but likewise the nature of the acidity.

I had two cases this winter, one suffering from pyorrhea and the other from erosion, and in these cases there was alkalinity of the urine due to phosphaturia, due in turn to acidity of the bladder. In another case of interstitial inflammation, the tissues about the necks of the teeth were extremely sensitive. The patient was in a state of apparent recovery and went to Atlantic City to convalesce, returning in three weeks with the mouth in a worse state than before. A physician was immediately consulted, and his opinion was that the affection was due to poisoning of the blood, caused by a return to the habit of soured vegetables with vinegar. The urine

in that case showed an acidity of thirty-eight per cent., which is not particularly abnormal, but the fact of the mucous membrane being acid when there was a plentiful flow of saliva shows, as Dr. Talbot stated, that the mucous membrane and the skin assume the function of the kidneys when renal elimination is insufficient.

I have found that the medical profession is commencing to recognize us, and to favorably accept the diagnosis framed by the dentist. Of course it is necessary for us to adopt the methods of the physician, and to carry on the work along medical lines, because it is not possible even for the dental surgeon of the highest order of technical skill to overcome systemic disorders, and I cannot help but support Dr. Talbot in almost all he has said. Although these erosions do occur at times in mouths where we can get no positive acid reaction, as explained by Dr. Head, we will find if we work along the line of Dr. Talbot's investigations that we will obtain proofs positive of the existence of constitutional disorders—metabolic changes—in patients in whom the dental disorders under consideration develop.

Dr. E. C. KIRK, Philadelphia, Pa. I want first of all to do what my predecessors have done—that is, to express my thanks to Dr. Talbot for coming here and presenting this topic; and secondly, my gratification that so large and so intelligent a body of dental practitioners is willing to listen to it and to consider it carefully. It seems to me that it marks an advance step when we can take up a subject of this kind in a dental society and for such a length of time maintain interest in its discussion. I may incidentally also say that I am pleased in this connection to recognize the great versatility of the dental mind. We have jumped from the consideration of root-canals to metabolism without a jar.

Anything I shall have to say in the discussion of the paper will be said for the purpose of enforcing the principles for which Dr. Talbot has contended, and even where I shall possibly differ with

him in regard to certain conclusions, I differ with him because I believe that what we want is to get at the truth as thoroughly as possible; and I shall ask you to take that as my motive in whatever I may say as enforcing the principles which he has placed before us for our consideration.

I want to make an appeal in the very beginning that we retain in our nomenclature the two terms abrasion and erosion, not alone for the reason that Dr. Talbot has given—that they serve to indicate relative localities of these disorders—but because I think from the very exhibit that he has made, and from what I think we are entitled to say today that we know about this question, that there are certainly at least two sorts of wasting processes besides dental caries. There is a wasting of tooth-structure which is distinctly the result of mechanical action, and there is also a wasting that cannot by any possible means be of mechanical origin, and such light as we have upon the cause of that second condition, as Dr. Talbot has shown us, indicates—in fact, almost proves—that it is due to the solvent action of certain waste products produced under abnormal conditions of the bodily nutrition. Therefore we must retain these two terms, for the reason that they fairly describe these two distinct processes—distinct in their causation, distinct in their clinical characters.

Referring to the experiments in the testing of the oral secretions made by my colleague and dear friend, Dr. Truman: What Dr. Truman did discover, as I understand it, was that under certain conditions or circumstances, in the mouths of patients suffering from erosion, he found an acid reaction as manifested by litmus. I do not think that it is a fair conclusion or deduction to hold that because he did find acidity, that it was necessarily a fermentative process that produced the acid. Dr. Talbot, if I remember the statement in his paper correctly, refers to this series of tests by Dr. Truman as proving the cause of the acidity to be due to fermentation. Is that the point you wished to make?

Dr. TALBOT. No, sir; my point was that it did not prove the question of fermentation.

Dr. KIRK. All that it could prove was that acid was present. I heard the report of these tests of Dr. Truman given from his own lips before the Odontological Society of Pennsylvania a number of years ago. I had myself been making tests of erosion cases with litmus, and I became very much interested in what he said. I was not in agreement with him at that time, but I finally repeated the litmus tests under the conditions which he laid down, and verified his findings. But further I became interested to discover the location or origin of this acid secretion, and in a paper* which I read before the First District Dental Society of New York in 1887 I recorded the method by which I had located the origin of the secretion so far as its local manifestation was concerned, namely, in the buccal mucous glands. That paper is on record in the DENTAL COSMOS, and is also referred to in Miller's work.† I later became interested in the nature of this acid secretion, and as to the way it was produced in certain individuals; and I noted, just as Dr. Talbot and others have done, that this acidity of the buccal mucous secretion was related to a certain type of cases, certain types of malnutrition, a type that we have come to recognize or classify under the general term of arthritism, or what was called in the paper under discussion, following the terminology of English and German writers, gouty diathesis or suboxidation—a type of disorder in which the characteristic thing is that there is a lack of correct relationship between the oxygen intake of the individual and the amount of food supply, so that the oxidation in the process of food metabolism is improperly performed (under-oxidation), and it is in connection with that class of cases that my observations were made. I then became still further interested by the work of Brubaker, which has been referred

to. Professor Brubaker, while not a practicing dentist, is a scientific physiologist, and he made the valuable suggestion that it was quite possible and highly probable that in those individuals who are suffering from this condition of suboxidation, the accumulated carbon dioxid in the blood plasma reacted as carbonic acid upon the basic phosphates of sodium and of calcium, and by chemical interchange, as Dr. Talbot has shown, converted these basic phosphates into acid phosphates. It is a well-known fact that in that form of malnutrition characterized by suboxidation there is produced an excess of CO_2 , and that the reaction between carbonic acid and the basic phosphates is the explanation of the normal acidity of the urinary excretion. It is a matter established by chemical investigation that the urine is acid because it contains these acid phosphates, and that the acidity of the urine rises in percentage correspondingly to the degree of suboxidation.

I want to direct your attention here today to a matter to which I have called attention elsewhere, viz, that there is a very definite relation between the amount of carbon dioxid produced through faulty metabolism and the percentage of urinary acidity. I do not expect all to understand what I am saying, but you can study it more carefully after it is published; but this is what happens: Every molecule, or unit, of free acid in the urine represents a molecule or similar unit of carbon dioxid in the blood plasma, for the simple reason that it requires one molecule of carbon dioxid to convert every molecule of the basic phosphates into acid phosphates. What is true of the calcium phosphate is true of the sodium phosphate—the action of the carbonic acid on both of these salts is quite parallel.

But I am unable to understand the reasoning of Dr. Talbot in his explanation of the relation of urinary acidity to the fluctuation in the percentage of acidity of the blood-stream; for if he measures the acid retention in the blood in terms of these acid phosphates as expressed by their percentage in the urine,

*DENTAL COSMOS, 1887, p. 50.

†"Micro-organisms of the Human Mouth," p. 42.

I disagree with him. My objection to that theory is based upon the fact that the acid phosphates both of sodium and of calcium are very much more soluble than the basic phosphates; so that these acid phosphates, because of their extreme solubility, have a relatively high osmotic tension and run out of the system very rapidly, consequently are less liable to be retained than the basic phosphates. So important is that fact that two prominent writers, one Dr. Ralfe of London and the other Dr. Tessier of Lyons, France, have both described a disease, which they term phosphatic diabetes, due to loss of phosphates in this manner, which has all the symptoms of diabetes mellitus minus the sugar factor.

The abnormal phosphatic loss coincident with high urinary acidity is also important because it furnishes one of those interesting demonstrations of the fact that in order to have normal health, a high vitality, a high opsonic index, or whatever you choose to call it, it is required that we shall have a certain number of nutritional factors working together harmoniously. We require for the maintenance of health, among other things, a proper kind and amount of nutritive material—among which is a definite supply of the phosphates. If these are rapidly eliminated the patient becomes phosphatically starved. And Michaels speaks of this, and refers to a further period in this condition when the patient becomes demineralized because the nutrient reserve of phosphates has become exhausted. This, as I take it, is because the excessive production of carbonic acid in arthritis has rendered the phosphates more soluble, and they consequently leave the system more rapidly, for the reasons I have already explained.

Holding these views I cannot accept the hypothesis set forth by the essayist that diminished acidity of the urine necessarily indicates increased acid retention in the body. I regard diminished acidity of the urine as evidence of lessened carbonic acid production, and consequently less conversion of basic into acid phosphates.

Now, as stated by the essayist, when the eliminative apparatus—for example, the cortex of the kidney—is overtaxed, when it is insufficient for the work of getting rid of the acid phosphates, then other structures epiblastic in origin may and do take up this eliminative function, and the acid phosphates are excreted, for example, by the skin; in these instances we have localized irritation, sometimes expressed as eczema; through the buccal mucous glands, and in that instance we have erosion of the teeth and hypertrophy of the mucous glands themselves. We have all seen these things. So there is not the slightest doubt in my mind, and I wish there was none in yours, that when we have erosion of the teeth we may not do otherwise than call it a symptom of a constitutional disorder, or, if you please, a local expression of a special systemic vice; and we know pretty nearly what that vice is, namely, the form of malnutrition called arthritism. Now, as Dr. Rhein explained, this condition is manifested early in the gums and teeth, long before the patient finds it necessary to go to a physician for the treatment of other local expressions of the same disease, and it is a part of our duty to recognize the meaning of these dental manifestations and to be able to point out to the patient these things, which later will cause suffering from some lesion like a defective liver or arterial sclerosis, unless detected and treated in the earlier stages. I think that is where our position as health guardians is of the utmost importance.

Reference has been made by Dr. Head to the inadequacy of the litmus reaction. It is a difficult thing to make tests with litmus and determine accurately just what reaction you have. Even the acid phosphates do not redden litmus, at least as I understand the meaning of the word reddened, but it "purples" litmus; the acid phosphates will give a purple or violet color with litmus solution which is not at all the same thing as when you put a drop of free acid in it, and yet the former may be mistaken for the latter color. Another thing: When you have the basic and acid phosphates to-

gether in a solution, that solution will manifest both a red and blue reaction to litmus. You have here, then, that condition which chemists call the amphoteric reaction. So that solutions of acid and basic salts have to be tested with both kinds of litmus and with other indicators. We will have to revise, as Dr. Head has said, our standard of litmus testing, and I am in accord with his statement that all past records depending upon litmus as indicating the reaction of the saliva, and possibly the urine, that have not taken into account a recognition of the amphoteric factor, will have to be very carefully scrutinized, if indeed they are not wholly valueless.

I want to say one word about urinalysis, because it has been referred to by Dr. Rhein, and I agree with the latter that urinalysis from the standpoint of the ordinary urinalysis report is of little value in the diagnosis of the metabolic conditions, the nutritional states outside of those problems having to do with definite lesions of the kidneys. That is not the kind of analysis we want in our studies of nutrition; but I presume he referred to the chemical composition of the urine, and that is of the utmost importance—almost the most important thing we have to depend upon. I do not agree with Dr. Talbot that the ordinary method of chemical analysis of the urine, which is based upon a study of a sample of the total urine for twenty-four hours, furnishes the most useful data. I think we can get a better picture of the nutritional state of the individual by examining the morning urine—for this reason: The morning urine represents the final result of the complete nutritional effort extending over a number of hours after the last food is taken. I therefore depend upon the analysis of the morning urine more definitely. I believe that we thus get more information from that kind of a specimen as to how the nutritional mechanism has treated its metabolic problem.

Finally, I would like to say a word as to the question of the diet list, the question of what to eat. I agree that there should be discrimination in the char-

acter of the food, and one of the gentlemen referred to the well-known fact that if we go to a number of physicians and sum up what each excludes, we should find in the end that the whole edible list has been cut out. Let us remember that there are two factors to be considered, viz, the quantity and the kind of food that we are taking into this human furnace, and then, the necessary adjustment of these factors—to what? To the amount of oxygen that the hemoglobin is able to carry to the tissues. You may dump an unlimited amount of building materials on a vacant lot, and if there happen to be a strike or no mechanics to use the material, you cannot erect the building. It is the function of the hemoglobin to carry the necessary oxygen, and we have to see that it is present in sufficient amount and in condition to carry the amount of oxygen necessary to the building. If even the hairs of our head are numbered, so also is the amount of hemoglobin in the circulation—i.e. our oxidizing power—as definitely limited, and when you take a greater amount of food than you can manage, you will have faulty metabolism, arthritism, loose teeth, erosion, pyorrhea alveolaris, and for Dr. Talbot's sake let me say also interstitial gingivitis.

Dr. TALBOT (closing the discussion). I agree with the last speaker in almost every point. There is no difference between his views and mine as to general principles involved. He speaks of the hemoglobin in the blood, and that is just the point that I made in my paper. If the blood be only partly alkaline, then the acidity must be reduced in order that proper metabolism may exist, and proper food and medicine must be given to build up the hemoglobin.

The first speaker takes up the subject of the particular acids. I avoided that—which answers both Dr. Rhein and Dr. Kirk. I did not want to spin too fine a thread. That is one great trouble with the profession; they want to get down to too fine points in everything. What is needed in science is a working hypothesis, and if we have not a working hypothesis

we can work always and accomplish nothing. I can mention numbers of things published in the dental journals, read in papers before societies, and discussed, for the past eight or ten years—all being wasted because we had not a working hypothesis to start on. We have a working hypothesis here in two points, no matter what the speakers have said who criticized the paper. I thank them for doing so, because I want to know what they are thinking about. If you pat me on the back and say I am all right, I do not learn anything. The fine points in regard to the particular acidity and how it affects the teeth I leave for you gentlemen to work out, but we have here a working hypothesis with which to start.

For more than twenty years I have been working on metabolism, trying to find out how it affects the mouth in interstitial gingivitis, Bright's disease, nephritis—as they are all caused by the same thing—and I am sure that what I have offered will be the means

of establishing a working hypothesis. I am not talking at random, for I know at least twenty-five or thirty physicians who are working along this line, and one of them tells me that he can cure eighty per cent. of children's diseases by simply watching the acidity and the indican in the urine. The whole practice of medicine is based on these two points, including interstitial gingivitis, erosion and abrasion, and also many other things—as I intend to bring out in a subsequent paper.

Now, there are two points to bear in mind; first, the degree of acidity, and second, the amount of indican. Correct these conditions and you will correct local conditions. Whether I am correct or not is immaterial; I have brought forth new ideas, and these new ideas will work out something that will be accepted by all. I do know this, however, that by correcting these two conditions you will have a basic principle to work on which is absolute.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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PUBLISHED BY

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, DECEMBER 1907.

EDITORIAL DEPARTMENT.

ARMY AND NAVY DENTAL LEGISLATION.

WE print in this issue two interesting communications growing out of our editorial inquiry in the November issue of this journal entitled, "What Has Become of It?"—one by Dr. B. Holly Smith, chairman of the N. D. A. Committee on Army and Navy Dental Legislation, the other by Dr. Richard Grady, dental surgeon to the U. S. Naval Academy, Annapolis, Md. Both of these communications are important as well as interesting because of the authoritative sources from which they emanate, and the Editor of this journal feels personally under obligation to both writers for the frank and explicit statements of their opinions.

For nearly fifty years the question of army and navy dental legislation has been formally before the dental profession as an end to be sought and attained if possible. It was at a meeting of the Western Dental Society held in July 1858 that the late Henry J. McKellops introduced a resolution creating a committee to take charge of national legislation for the desired end. No dental practitioner doubts the desirability—even the necessity—of making adequate provision for the care of the teeth of those

engaged in our national defense. Outside the dental professional ranks there might have been found in the earlier days of this movement honest doubters as to its necessity, but in the course of recent efforts to secure national legislation providing an efficient and adequate dental service in connection with the army and navy, it is safe to say, speaking generally, that no one after a review of the situation has objected to the enactment of such laws on the ground that they were not needed, or that the proposed service was not valuable upon sanitary and humane grounds.

All the objections that have, to our knowledge, been urged against a properly commissioned corps of dentists in the army and navy have been animated by motives of expediency or of selfishness. All legal innovations disturb the existing order of things to the extent of working a hardship to somebody—that is to say, someone's private interests must necessarily suffer in order that by wise legislation the greatest good to the greatest number may be secured—and opposition from that fact has necessarily arisen. But, still further—the proposed legislation creates new offices to be filled, and consequently offers opportunities to the ambitious, and again consequently a strife and scramble is created in the effort to secure whatever of honor or emolument, or both, these new opportunities may afford. Hence it is that in the race for place the factor of individual interest overtops and excludes the broader and more important questions of the good of the service, the good of the dental profession. It is about time, we think—and we say it in no vindictive spirit, but wholly from a desire to see the profession of dentistry benefit as it may benefit by coming into what is clearly its own birthright—that so important a question as the creation of an army and a navy commissioned dental corps should be adjudicated in the light of what is the best thing for dentistry and for the physical welfare of the defensive service of the nation, and not decided upon the basis of "Who is your friend?" or "Who's friend are you?"

It strikes us that it would be a good way to celebrate the semi-centennial of Dr. McKellops' resolution previously referred to, by attacking this problem from the professional and non-personal standpoint, and, by presenting to Congress a solid professional front having "the good of our profession" as its animating motive, carry through an act that will bring the benefits of dental art and science within the reach of our soldiers and

sailors regardless of the objections of the few who oppose these measures because they do not in all respects fit in with their own selfish interests. That such has been the source of much of the opposition to these measures is evidenced by the closing paragraph of Dr. Grady's communication (printed at pp. 1266-69), and the following direct statement from Dr. Holly Smith, which we repeat for emphasis in this connection: "We discovered something that caused us a great deal of embarrassment, and that is that our profession is not united as to what is desirable legislation, and that many outside of the Legislative Committee of the 'National' have not only followed closely every effort to secure legislation, but in many instances have used their utmost efforts to prevent the enactment of proposed legislation. This has placed us in a rather ridiculous position before the legislators and the departments. I firmly believe that had no interference with the work of the Legislative Committee of the National been undertaken by outsiders, satisfactory legislation would have been accomplished before the meeting of the short session; and I despair of any accomplishment with an organized band of knockers and kickers ready at any moment to enter objection."

Dr. Holly Smith's letter here follows:

1007 MADISON AVE., BALTIMORE, MD.,
November 12, 1907.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—Under the title of "What Has Become of It?" you have called for some explanation from the Committee on Legislation of the National Dental Association. You say that about that time (Atlanta, 1906) "The committee was reorganized and the expectation aroused that something tangible and satisfactory in the way of accomplished results would quickly follow." As a matter of fact, no reorganization of the committee took place at that time. Subsequently, the Executive Council, having the authority to appoint the committee, met in Buffalo, and decided, because of the dissatisfaction and dissensions which had arisen, to appoint no Legislative Committee for the ensuing year.

I protested against that action, and at a called meeting of the Executive Council and some of the members of the National Association held in Washington in the middle of the winter, a Legislative Committee was appointed, and I was named as chairman, much against my wishes and protests.

The committee undertook zealously to further the progress of measures for the creation of a dental corps in the Navy, and for the enactment of a bill, which had passed the Senate and was already on the calendar of the House, to give status to the contract dental corps in the Army. In my judgment every step that was possible was taken, and every influence brought to bear for the passage of this measure. The members of the profession in distant states co-operated in an effort to consummate such action.

We did not succeed, simply because the Speaker of the House stood like a stone wall against the enactment of any constructive legislation at the short session of Congress.

A report was made to the Executive Council at the meeting in Minneapolis, signed by me and the only other member of the committee present, to that effect; with the additional explanation that the medical bill giving status to the contract surgeons in the Army had also failed of passage, notwithstanding the fact that the combined and united efforts of the medical profession all over the country had been brought to bear upon Congress for its passage, and, that the President and Secretary Taft had both urged it.

Perhaps one thing was accomplished at the short session by our committee. We made friends for our measures both in the departments and in Congress. We secured from the chairman of the Military Affairs Committee a concession which, if it can be taken advantage of, will enable us to have status given to every member of the present contract corps with the possible exception of two.

Now, Mr. Editor, to be perfectly frank with you, we discovered something that caused us a great deal of embarrassment, and that is that our profession is not united as to what is desirable legislation, and that many outside of the Legislative Committee of the "National" have not only followed closely every effort to secure legislation, but in many instances have used their utmost efforts to prevent the enactment of proposed legislation. This has placed us in a rather ridiculous position before the legislators and the departments. I firmly believe that had no interference with the work of the Legislative Committee of the National been undertaken by outsiders, satisfactory legislation would have been accomplished before the meeting of the short session; and I despair of any accomplishment with an organized band of knockers and kickers ready at any moment to enter objection.

The chairman of the Military Affairs Committee told me that in the enactment of the medical bill hundreds of men who had spent the best of their lives in contract medical service would be thrown out of their positions, and yet up to that time the medical profession presented a united front in advocating the passage of this measure, and no objections had been raised by those who would suffer such loss.

I am glad to say, Mr. Editor, that I am no longer chairman of the Legislative Committee, nor would I under any circumstances undertake it again. I firmly believe that it is necessary for the chairman of the committee to be a local man, and I know of no more efficient and influential person in Washington than Dr. Williams Donnally, the gentleman whom the Executive Council have selected as chairman.

Your editorial mentions the fact that great expenses had been incurred by the Legislative Committee of the National. I beg to say, that although I traveled to Washington a great many times, and spent time and money, I made no charge to the National Association for these expenses, and the only bill rendered by the Legislative Committee was a bill for thirty dollars for telephone and telegraphic service and for carriage hire for persons who were assisting the Legislative Committee, the members of the committee having rendered no account of their expenses.

I am very glad that the Cosmos has brought this matter to the attention of the profession, and hope that you will continue to take an interest in the much-desired legislation for our profession. I shall be glad to have a word later as to the prospect of our securing it.

Hastily but sincerely yours,

B. HOLLY SMITH.

A MEMORIAL TO WILLOUGHBY D. MILLER.

At the meeting of the *Fédération Dentaire Internationale* held last August in Amsterdam, a committee was appointed for the purpose of taking under consideration the question of a perpetual memorial to Prof. Dr. Willoughby Dayton Miller, the recently deceased president of the F. D. I., and to report at the next meeting at Brussels in 1908 a plan for putting this purpose into practical effect. The committee appointed by the F. D. I. consists of Drs. Florestan Aguilar, Truman W. Brophy, Ch. Godon, John E. Grevers, N. S. Jenkins, J. H. Mummery, Carl Röse, and Rudolf Weiser. Of this committee Dr. Carl Röse is the chairman.

The object for which this committee has been formed is one which will beyond doubt meet with the sympathetic approval and active co-operation of a large body of dental practitioners throughout the world. The work of Miller places him among the list of the benefactors of the human race, and among the very few who have been benefactors of dentistry. It is therefore peculiarly fitting that the proposition to create a perpetual memorial of him has at once been given an international character by emanating from our representative international body. In its present stage the committee desires for its guidance certain information as to the trend of professional thought concerning the form which the proposed memorial should take—it being desirable to determine that point before taking steps to collect the funds necessary to its accomplishment. In a circular letter to the members of the committee, Dr. Röse asks a series of questions, as follows:

(1) What form shall the memorial take? To erect a statue or paint a portrait would be only to enrich a single community. The fame of Miller belongs to the whole world of science, and it would therefore seem more appropriate to perpetuate his name for all time by a prize open to international competition.

(2) Shall we therefore raise a sum of money the interest of which shall be used as a prize for the best and most original work done during a series of years?

(3) How shall such a sum be raised?

(4) Shall we state a sum which we regard as the minimum necessary to our purpose, or shall we proceed without a determination as to the amount we shall try to raise?

(5) How shall this sum be invested, and subject to whose order?

(6) Shall we recommend that the prize consist of a valuable medal alone, or of a single medal accompanied by the remainder of the interest on the capital?

(7) Shall the prize be allotted at a period, say, of five years, and by whom?

(8) Should the prize be only for scientific work in dentistry, or should practical work also be included?

(9) What other suggestions can you offer regarding the undertaking in general or in detail?

While these inquiries were addressed only to members of the committee of the F. D. I., they raise important questions which we think should be submitted to and considered by the dental profession at large, and we have therefore given them publicity here in order that opportunity for a full consideration and discussion may be had. We ask that all interested in this matter will express their opinions upon it, and make any suggestions that they may deem helpful as to the form which the memorial shall take and as to the plan for its accomplishment. Suggestions may be sent directly to Dr. Carl Röse, chairman, Dresden, Germany; to Dr. Truman W. Brophy, Chicago, the American representative on the committee, or be forwarded through the medium of the Editor of the DENTAL COSMOS.

CLOSE OF THE VOLUME.

THE present issue will round out the forty-ninth year of continuous publication of the DENTAL COSMOS and somewhat more than the sixteenth year of its present Editorship. It has passed a variety of stages of development in the passage of time, its form and dress have been altered as circumstances seemed to demand, but in the essential features of its policy it has never deviated from its ideal to be the best of its kind. Wherever or whenever it has fallen short it has not been because of any weakening in its policy nor in honest effort to practically realize its ideal. It has grown as the dental profession has grown, and as its purpose has been always to reflect the representative thought of that profession, so have the character of its matter and its mode of presentation been chosen with respect to the accuracy and fairness with which its text pages represented the best accomplishment of dentistry.

No attempt has been made to achieve the unattainable by trying to please everybody, but to the best of our ability and judgment the effort has been continuously made to present a record of dental achievement of which no member of the dental profession need feel ashamed, and to foster those higher ideals of which our profession may always be proud.

Such has been and will continue to be its purposes, regardless of minor personal interests or of the criticisms or antagonisms of the proprietors of minor personal interests.

On the other hand we ask for and welcome critical suggestions from our readers whenever these are given in a constructive spirit and with a view to the betterment of the DENTAL COSMOS. We want to make the magazine better than it is, in any way or in any feature where it can be practically done. The Editor has every reason to believe that the DENTAL COSMOS is needed by the dental profession, from the simple reason that they subscribe—pay for it, and he sincerely trusts that they also read it; but, while he feels much in touch with the very wide circle that constitutes his audience, he nevertheless needs from time to time, for the betterment of his work and for increasing its helpfulness, the inspiring effect of the personal word or note that will enable him to more accurately judge of the results which it is the purpose of the journal to accomplish as an uplift in the professional lives of its readers. To this end he asks for expressions of personal opinion and suggestions from any or all who think the DENTAL COSMOS can be made more useful or valuable to them during the coming year.

REVIEW OF CURRENT DENTAL LITERATURE

Conducted by JULIO ENDELMAN, D.D.S.

[*Revue générale de l'Art Dentaire*, Paris, August 1907.]

ON CERTAIN REFLEX OCULAR DISTURBANCES OF DENTAL ORIGIN. BY DR. A. BEAUVOIS, PARIS, FRANCE.

Notwithstanding the intimate anatomical relationship existing between the eye and the teeth, no treatise on ophthalmology so far published contains a chapter devoted to the study of ocular disturbances the result of pathological phenomena about the teeth and oral mucous membrane. Apart from the direct communication between the orbit and the maxillary sinus by means of the periodontum, and the thinness of the upper wall of the maxillary sinus, which corresponds to the floor of the orbit, the eye and the teeth are still more closely related through the venous and nervous systems.

The veins play the most important rôle in the transmission of infection, and in this connection it is of importance to recall that the labial and coronary venous plexuses and the angular and facial veins empty in the ophthalmic, which in turn empties in the coronary sinus. The nerve relationship between the organs under consideration may be traced as follows: The Gasserian ganglion gives off three branches, the ophthalmic, the superior maxillary, and the inferior maxillary. The ophthalmic nerve is joined by filaments from the cavernous plexus of the sympathetic, and communicates with the third, fourth, and sixth nerves, and divides into three branches, the lacrymal, frontal, and nasal. The terminations of these nerves go to supply the scalp, part of the integument of the forehead, the upper eyelid and side of the nose, the palpebral conjunctiva, the bulbar conjunctiva, the laryngeal mucous membrane, with that of the frontal sinus, and the lacrymal and Meibomian glands. In addition, the ophthalmic branch sends filaments to the perio-

teum and osseous tissue and branches of communication to the orbital branch of the superior maxillary nerve. Furthermore, the ophthalmic nerve through its nasal branch is in direct communication with the ophthalmic ganglion, which sends several small filaments—the ciliary filaments—to the iris, and one to the retina.

The superior maxillary nerve supplies the upper teeth and the skin and mucous membrane of the upper lip. Another important branch of this nerve, from the standpoint of the subject under consideration, is the orbital, by reason of the anastomosis of its temporal branch with the lacrymal branch of the ophthalmic. Also, the branches of distribution of the temporal branch of the orbital communicate with the facial and auriculo-temporal branches of the inferior maxillary nerve, and those of the malar branch, after supplying the skin on the prominence of the cheek, join with the facial and palpebral branches of the superior maxillary. The temporal and malar branches of the orbital, in addition, anastomose with the temporal and malar branches of the facial nerve.

It will be seen that the teeth, although intimately related to the conjunctiva, lids, lacrymal gland and iris, through the trifacial nerve, could not induce pathological changes in the deeper ocular structures, except through the bloodvessels, the maxillary sinus, or by the spreading of a periostitis. Ocular disturbances of dental origin may therefore be properly divided into two kinds: Those affecting the anterior segment of the eye, supplied by the trifacial, and those affecting the posterior segment. The former are more frequent than the latter. The disturbances affecting the anterior segment are lacrymation, conjunctivitis, paralysis of accommodation, neuralgia, and blepharospasm. Simple lacrymation—that is to say, the variety not accompanied by inflammation or suppuration of

the lacrymal canal or sac—is frequently encountered. In such cases an examination of the conjunctiva shows that the membrane is but slightly inflamed, if at all, and that the lacrymal canal is unobstructed. The disturbance in such cases is therefore due to hypersecretion of the gland, which may be caused by a variety of factors—diseases of the teeth among them. This pathologic possibility was long ago pointed out by Galezowski and his pupils, Mangin, Despagne, and Abadie, the latter of whom reported a number of such instances. A case that came under the author's own observation was that of a man, aged thirty-six years, who at the age of thirteen years received a violent blow on the nose. It resulted in deviation of the septum, with deformity of the nasal canal. However, contrary to what occurs in traumatism of this nature, the patient did not suffer from lacrymation. At the age of thirty-four, on account of severe toothache, he had the first molar and one of the incisors on the deviated side extracted. A month afterward lacrymation appeared, although the canal was not stenosed. This phenomenon of reflex irritation can be explained by remembering that the superior maxillary and ophthalmic divisions of the fifth cranial nerve communicate with one another, the orbital sending a branch to the lacrymal gland and communicating with the lacrymal branch of the ophthalmic.

Another case was that of a young woman, eighteen years of age, who complained of periorbital neuralgia, pain on reading, and lacrymation. An examination of the lacrymal canal on the affected side revealed no abnormality whatsoever. The refraction test showed that the eye on the affected side was emmetropic, although there was slight diminution in the power of accommodation. For distances the visual acuteness was normal. Diagnosing the case as one of asthenopia of accommodation with lacrymation, the author prescribed visual rest, the use of smoked glasses, and internally small doses of quinin salicylate. A few days afterward the patient reported slight visual improvement, but persistence of the lacrymation. An injection was then made through the lacrymal canal, and the fluid escaping through the nasal fossæ showed that there was no obstruction in the canal. It was at this time that the author decided to dilate the opening of the

lacrymal canal, but in attempting to do so he accidentally discovered that the roots of the upper second and third molars on the affected side were very painful, and at once refrained from carrying out the proposed intervention. He thereupon questioned the patient regarding the two molars, and ascertained that from the time gold fillings were inserted in them the roots had been so painful to pressure as to prevent her from using the molars during mastication. Dr. Beauvois at once directed her to consult a dentist. The gold fillings were removed and the root-canals antiseptically treated. Two months afterward, when her teeth were again in a healthy condition, the trouble in the eye and lacrymal gland had entirely disappeared. Lacrymation, when persisting for a more or less prolonged period of time, may bring about such severe complications as conjunctivitis, blepharitis, ulcer of the cornea, and keratitis, as a rule, very difficult to subdue.

Years ago Galezowski called attention to a considerable number of cases of conjunctivitis, keratitis, and phlyctenula in children, caused by irritation from the teeth directly, or indirectly, by disturbing the vital balance of the affected parts.

Strabismus is also in some cases due to dental disturbances. Javal, in 1866, wrote concerning the subject as follows: "Convergent intermittent strabismus, or to state it more accurately, the variable type of hypermetropia in young adolescents, or young children who scarcely squint ordinarily, but who upon experiencing an emotion of any kind or unduly exercising their eyes, or upon being subjected to nervous excitement, or suffering from some general disorder induced by dentition or any other cause, show a shocking deviation, and occasionally a sort of chorea of the muscles of the eye which causes much anxiety to the parents." Javal thinks that a large number of cases of convergent strabismus are caused by a temporary paralysis of accommodation, and as Schmidt, on the other hand, has demonstrated that paralysis of accommodation is a frequent complication of dental disorders, strabismus may indirectly be caused by pathologic conditions about the teeth.

If the frequency of strabismus and the large number of observations recorded in our clinics are considered, one could not but feel

astounded that the dental phase of the etiology of that disturbance should not, as yet, have become a definite pathologic entity. The cause is doubtless the result of negligence on the part of observers, and of lack of knowledge in the past, concerning the relationship between the ophthalmic and dental regions. At the present time, however, paralysis of accommodation of dental origin is properly recognized. Schmidt has observed seventy-three cases of diminution of the amplitude of accommodation in twenty-two cases of dental disease, and Parker has found that strabismus is more common after disease of the upper teeth. In isolated instances, instead of paralysis of accommodation, contraction of the ciliary muscles ensues.

Mydriasis with paralysis of accommodation is another ocular reflex often traceable to such dental diseases as gingivitis, caries, periostitis, or to extractions. It is not infrequent that patients so affected are informed that the trouble is due to a lesion of the ophthalmic nerve, when in reality the cause is by far less serious. Caries or pericementitis may produce a mydriasis, which will disappear upon the removal of the cause. Desmarres has recorded several observations, and Galezowski invariably attached considerable importance to the examination of the teeth in cases of mydriasis without alteration of the fundus oculi. A badly inserted filling, the presence of caries, or the extraction of a tooth are often sufficient individually to induce mydriasis.

On the other hand, diseases of the eye may induce dental disorders which persist until the primal affection is relieved or cured. Javal cites a case of glaucoma which caused intense dental neuralgia, and Galezowski, a case of rheumatic iritis which gave rise to toothache of such intensity that two teeth were unnecessarily sacrificed in the endeavor to relieve the patient.

[*New York Medical Journal*, September 21, 1907.]

NUTRITION A FACTOR IN TOOTH-DEVELOPMENT. BY WILLIAM J. LEDERER.

The author (*Medical Record*) states that the various conditions affecting the dental organs can be classified as follows: First, as those having an influence upon the teeth during intra-uterine life, beginning with the

first appearance of the epithelial inflection in the embryonal jaw (thirty-fourth to fortieth day) and ending at birth; second, those conditions affecting the denture during infancy and childhood, i.e. during the period beginning at parturition and ending with the eruption of the first permanent tooth, and third, those conditions affecting the teeth from the time of the eruption of the first permanent tooth until death, or such time as the teeth are lost. It is evident that in the first class the conditions affecting tooth-development are factors conveyed by the fetal circulation, and are traceable to the mother. All conditions which will lower the vitality of the mother are bound to affect the child *in utero* in some way, and the developing dental organs, being part and parcel thereof and receiving blood supply from the same source, will also be modified if there be any aberration—chemical or physical—from the normal in the blood. As to foods that are conducive to proper dental development, the author cites Von Winkel of Munich, who describes a dietary for pregnant women as follows: Breakfast— $\frac{1}{2}$ liter of milk, one roll. Noon— $\frac{1}{2}$ liter of soup, 150 grams of beef without bones, $\frac{1}{2}$ liter of vegetables or pastry (not fat), $\frac{1}{2}$ liter of beer.

Milk is the most important of all animal foodstuffs, containing all the elements necessary for the maintenance of life, and thus constituting a complete food. It contains all the four classes of food principles—namely, proteins, carbohydrates, fats, and salts. Two great mistakes frequently made in infant feeding are the substitution of cow's milk for maternal feeding where mother's milk is obtainable, and the too early ingestion of carbohydrates and other foodstuffs that have no place in an infant's dietary. Opinions differ as to the period when young children should be given other food than milk; however, the consensus of opinion points to the fact that no solid food of any kind should be given prior to the eruption of the deciduous teeth. Milk (maternal until about the eighth month, unless weaning becomes necessary through disease of the mother at an earlier period; good cow's milk after that) should be the principal food for eighteen months. Starchy food should be withheld for about a year.

Nutrition is the basis of all development, and if this important function is supervised according to a common-sense, physiological

régime, the result will be a normally developed organism. It means a healthy body, sound mind, and good teeth. Therefore nutrition is a very important factor in tooth-development. Were it not so we would not observe the abnormalities of tooth-development and eruption following diseases of nutrition, such as scurvy, rickets, marasmus, etc.

[*La Estomatología*, Bilbao, Spain, September 1907.]

GANGRENE OF THE MOUTH (CANCERUM ORIS): ITS CAUSE, EVOLUTION, AND TREATMENT BY MEANS OF METHYLENE BLUE. BY DR. MIGUEL CASANET, MADRID, SPAIN.

At a session of the Royal Academy of Medicine held in Madrid during 1905, Gonzales Alvarez described three cases of gangrene of the mouth treated successfully with methylene blue. The author of the present article was at that time very favorably impressed by the report of Dr. Alvarez, especially in view of the fact that it substituted for the potential or actual cautery a comparatively harmless agent. Since then he has applied the methylene-blue treatment in five cases, with excellent results, and although this number is perhaps too small to warrant the framing of definite conclusions concerning the virtues of the compound, still it seems ample enough to prove its wonderful curative properties.

All factors responsible for a lowering of vital resistance during infancy or early childhood are predisposing causes of cancerum oris. It occurs almost exclusively during the first few years of life, doubtless on account of the greater susceptibility of the tissues at that period. Among the so-called morbid causes measles is the most frequent, the others being smallpox, scarlet fever, broncho-pneumonia, typhoid fever, whooping cough, etc. Notwithstanding the important researches of Samson, Netter, Babes, and Zambilovici, who studied and cultivated a bacillus that, injected in the mouths of rabbits, produced gangrene, we continue to be in the dark concerning the bacterium which causes the disease in children. Although great importance is attached to the decrease in the vital forces and to infection processes, we must still recognize the fact that the direct cause of the infection is doubtless a bacterium bearing a

strong resemblance to the *vibrio septique*, if not the latter itself.

The majority of authors describe the disease as beginning in the mucous membrane of one cheek or in the lower lip, but Dr. Casanet has observed that it may begin in both cheeks at the same time, or in the gums, the starting-point being a small vesicle, which after breaking is transformed into a dark spot.

The initial symptoms of gangrene of the mouth (cancerum oris, noma, gangrenous sore mouth) are painless, and as a matter of fact throughout the disease the unfortunate patient has to bear but little pain. After a few days the tissues begin to swell and an area of hardened tissues, several centimeters in length, appears at the level of the initial ulcer. The posterior section of this area becomes gangrenous, and outside, on the corresponding section of the epidermis, a spot becomes visible, at first livid in appearance, later on black. The spot on the outside is sometimes preceded by a phlyctena filled with sanguineous fluid. In the severe forms of the disease the gangrenous destructive process advances rapidly. The breaking down of tissue, although as a general rule limited to the middle of the cheek, in some instances spreads to the nose, eyelids, ears, chin, and neck. In the cavity of the mouth it attacks the tongue and gums, causing the loss of the teeth and denudation and necrosis of the maxillæ. The saliva escapes through the cheeks and has a characteristic fetid odor. At first it is transparent, later it becomes sanguineous and mixed with putrid matter or tissue debris from the gangrenous area. The breath is likewise very offensive. The strength of the patient varies, and while in some cases it is greatly diminished, in others the child seems sufficiently strong to sit up in bed, and even play.

Thirst is invariably very intense, and the appetite is either good or altogether absent. Additional symptoms are slight elevation of temperature—unless there be some complication present, in which case it may rise considerably, although as a rule the temperature is subnormal; the pulse is weak and frequent; the feet are edematous; there is somnolence and delirium, and often such serious complications as broncho-pneumonia.

The course and termination of the disease depend on the severity of the infection, the or-

gans involved, and the nature and amount of septic products absorbed. It is therefore impossible to state in a concrete manner what the duration of the disease will be, for while in some cases it spreads and persists for a long period of time, in others the infection is limited and of short duration.

Cancrum oris may be confounded with malignant pustule (true anthrax), gangrenous aphthæ, and ulcero-membranous stomatitis. The differentiation of these diseases, however, can be accurately made if it be remembered that anthrax begins in the skin and not in the mucous membrane, and that its etiology is absolutely distinct; that gangrenous aphthæ are not accompanied with induration of the soft tissues, as seen in cancrum oris, and lastly, that ulcero-membranous stomatitis begins in the gums, does not cause a nucleus of induration in the cheek, or the destruction of that or contiguous areas, but progresses slowly, detaching the periosteum and attacking the bone to the point of necrosis.

The author then relates several cases which came under his observation. The first was that of a child eight years of age, the youngest of five brothers and sisters who had succumbed to convulsions, meningitis, and eruptive fevers. Parents alcoholic, especially the mother. Child poorly fed, and but recently recovered from an attack of measles. The onset of the disease was marked by the appearance of a violaceous spot on the left malar prominence, fetidity of the breath, great depression, abundant secretion of sanguineous malodorous saliva, intense pallor, diarrhea, thirst, anorexia, slight fever, and feeble pulse. On the internal surface of the cheek there was an indurated zone of approximately the size of a silver dollar, filled with saliva or gangrenous detritus. Treatment consisted at first in frequent irrigations with potassium permanganate $\frac{1}{2}$: 1000 alternated with that of potassium chlorate 4 : 100, and applications of a solution of methylene blue 2 : 100 every two hours. In addition, a general treatment was instituted, consisting of quinin internally every two hours, of an injection of 200 grams of artificial serum, and a lacteal régime. On the day following the beginning of the treatment improvement was already noticeable, inasmuch as the fetidity and the induration had disappeared, the ptialism was less accentuated, the spot on the cheek was of quasi-normal color, the pulse less frequent and

stronger, the diarrhea less severe, and the appetite slightly better. The treatment, with the exception of the permanganate solution, was continued for four days, at the end of which period the disturbance in the cheek, as well as that in the gum, upper and lower, had entirely disappeared—not, however, without having caused the death of two sections of both jaws; these it will be possible to replace by a prosthetic appliance after the completion of the child's bodily development.

The author describes four additional cases, almost identical to Case I, in which recovery took place after a few days' treatment with methylene blue, and brings his article to an end after summarizing his observations and conclusions as follows:

1. Alcoholism in the parents decreases the organic resistance of children, and by rendering them more susceptible to all kinds of diseases, especially to those of the infectious type, predisposes to gangrene of the mouth.
2. Methylene blue acts very rapidly in the treatment of cancrum oris.
3. This rapidity of action is doubtless due to its power to penetrate the tissues beyond the diseased areas, by virtue of its not being a coagulant.
4. Methylene blue arrests the disease in from four to six days—the sooner the treatment is instituted, the quicker being the recovery.
5. Methylene blue is innocuous; it does not cause loss of tissue, and therefore neither tissue retractions or disfiguring scars.
6. The solution of methylene blue employed in the five cases under consideration was the 2 : 100, but this proportion may be increased or decreased according to the indications of the case in hand.
7. Methylene blue should be employed in all cases of cancrum oris.

[*L'Odontologie*, Paris, October 15, 1907.]

PROTEOL IN THE TREATMENT OF INFECTED ROOT-CANALS. BY P. VANEL.

Some time ago the author called attention to proteol, a combination of casein and formic aldehyd, in the treatment of caries of the fourth degree. After removing the disorganized contents of the canal and treating the latter with antiseptic substances in the ordinary way, the canals and pulp-chamber are filled with a paste composed mainly of pro-

teol. The author has tried the method under discussion in about fifty cases—all patients of the École Dentaire—and only in two were the results unsatisfactory. In all the other cases the sealing of root-canals and pulp-chambers was followed by such excellent results as to invite trial in cases of pulp-supuration, often so difficult to subdue.

The variety of proteol for dental purposes is a fine white powder, easy of manipulation, and miscible with alcohol and the essential oils. By mixing it with alcohol and one or two drops of eugenol a thin, non-irritating paste is obtained, of which the basis or principal ingredient is formic aldehyd, the most effective antiseptic available for dental operations.

[*Les Annales Dentaires*, Paris, September 1907.]

RESECTION OF THE APEX. BY DR. BÉAL, LILLE, FRANCE.

When a dento-alveolar abscess reaches a state of chronicity on account of the presence of an area of disorganized or necrosed tissue in the apical third of a tooth-root, and when all possible operative or therapeutic means instituted through the canal are powerless to

eradicate the infection and its manifestations, it is admissible either to extract, cut off the dead portion of the radicular tissues and replant the tooth, or to excise the dead tooth-structure through the gum, with the tooth *in situ*. This operation, inappropriately referred to by recent writers under the ponderous designation "amputation of the root," was described by Claude Martin in 1881, and has since then been successfully performed in comparatively rare instances in Europe and in the United States.

The operative technique advocated by Dr. Béal may be described seriatim as follows: Filling of the root-canal with temporary stopping; induction of local anesthesia by a hypodermic injection of cocain; circular or ellipsoid incision in the gum over the apex of the root; resection of the necrosed area by means of a sharp fissure bur revolving in the dental engine; curettage of the abscess cavity; irrigations of the cavity with H_2O_2 , 3 per cent. solution, or with formalin 1:1000; treatment of the cavity by filling it with salol—an active tissue stimulant.

The healing of the cavity by first intention is complete at from twenty-five to thirty days after the operation.

PERISCOPE.

To Trim and Sterilize Cotton.—In winding cotton on a broach it is apt to be extended a little beyond the end, and if not removed prevents the dressing proper from reaching remote parts of the root. To dispose of this tag-end touch it to the flame; sterilization comes with the fire.—*Dental Office and Laboratory*.

To Remove from the Skin Black Stains Caused by Silver Nitrate.—Black stains on the skin, caused by silver nitrate, in stick or solution, may be whitened, and their removal much expedited, by the application of a solution made according to the following formula:

R—Mercury bichlorid, ȳȳ gr. x
Ammonium chlorid, f3jss
Water,

Sig.—Apply, to stains on the skin, with friction.

—*Canadian Journ. of Med. and Surgery*.

VOL. XLIX.—97

Quick Filter.—A nice and quick way to filter water for hypodermic use is to boil the water in a teaspoon over a common flame; place a small piece of absorbent cotton in the spoon and draw the liquid into a syringe through the cotton. By so doing you get a perfectly clear solution.—W. J. FOSTER, *Dental Summary*.

Plaster and Sand Investment.—The following, where heat is used, as in soldering bridges, gold, or silver plates, will be found to meet every requirement; the writer has used it for twenty years; To two tablespoonfuls of finely sifted building sand add water sufficient to little more than wet it; add plaster, stirring thoroughly, and repeat the process until the mixture is of the right consistence; invest bridge or plate. Once familiar with the use of this simple investment your readers will use no other. It will not crack.—*Dental Office and Laboratory*.

Mouth-wash for Diabetics.—Croftan, in the *Clinical Review*, recommends—

R—Beta-naphtholis,	gr. v
Sodii boratis,	ʒvj
Aquæ menth. pip.,	fʒvj
Aquæ dest.,	Oj. M.

Sig.—To be used as a mouth-wash.

—*Monthly Cyclopedia of Pract. Medicine.*

Ointment for Neuralgia.—

R—Menthol,	0.75 gram
Cocain,	0.25 "
Chloral,	5 grams

M. et ft. unguentum.

Sig.—Apply to the painful part and cover with a gauze bandage if the neuralgia is periorbital or hemicranial.

—*New York Med. Journal.*

A Consideration of Some of the Factors which Contribute to Success in Abdominal Operations.—Dr. J. H. Dauber, in the course of a paper dealing with this subject read before the Chelsea Clinical Society, said that oral asepis must, previous to operation, receive careful attention. Carious teeth and purulent gums are often productive of toxemic symptoms, and parotitis and parotid abscesses are not the least of the troubles that may be caused thereby. It may be necessary to bring into requisition the services of the dentist, though patients often resent this with unusual vigor. At all events, nurses cannot be too assiduous in their endeavors to keep the buccal cavity in a clean and healthy condition.—*Dental Surgeon.*

The Use of Tannin in Painful Tooth-Affections.—Max Kner, in the *Wiener Med. Presse*, states that he has often noticed in pyorrhea alveolaris pains similar to those of neuralgia or rheumatism, attacking one or more teeth, and resisting all attempts at relief. The patient frequently clamors for the removal of the tooth. Kner, in such cases, uses a concentrated alcoholic solution of tannin:

R—Tannin,	gr. xxx
Spts. vini rect.,	ʒijss

With this solution he bathes, by means of a swab of absorbent lint soaked therein, the whole of the side affected along the border of the gums, and then allows the patient to repeat this procedure if the pains return. After this bathing the pain quite disappears, and the pyorrhea clears more quickly and easily under the influence of tannin than with silver nitrate and other means, while loose teeth are tightened in their sockets.—*Practitioner.*

To Separate Incisors.—The divergence of the interdental spaces of incisors often occasions difficulty in separating, on account of the tendency of the wedge to impinge upon the gum. This may be avoided by first placing a piece of binding wire in the space. Now place the wedge snugly in position, twist the ends of the wire together over the incisal edge of one of the teeth to be separated, and drive the wedge as hard as desired. For additional security the wire may be carried, after the first twist, to the next space, for another turn.—JOHN WARNER KEYES, Washington, D. C.

The Right Light in the Operating Room.—The wall tints of the operating room have an ocular value, and should vary according to the kind and amount of the general illumination. If a north or west light be generally used, dull cream, light buff, or light green paper, paint, calcimine, or burlap may be used with benefit. If the light be from the east or south, still darker tints are unobjectionable. In other words, while always using soft, unglazed colors, these may be made to vary with the intensity of the light admitted to the operating room—the brighter the illumination the darker the wall tints. Let me repeat: Glazed paper or other objects that strongly reflect light into the eyes of the operator should be banished from the dentist's operating room.—*Dental Review.*

Manipulation of Amalgam: Introduction and Packing.—Let me emphasize the packing. Amalgam cannot be wiped into a cavity successfully. It is necessary to have resistance when packing this material, and if the walls of the cavity do not furnish this resistance, it should be supplied by means of a matrix, which should be well and firmly adjusted to the cervical margin and gingival third of the cavity—this prevents the amalgam from being carried below the cavity margin and the filling from encroaching upon the interproximal space. The gingival wall should always be flat, as should the face and sides of the points used in packing, which in addition should be small enough to reach every margin without unduly pushing the matrix from the margins. The packing capacity of a round point is practically nil; it merely ploughs its way through, pushing the amalgam aside toward the point of least resistance, while a flat-faced plugger carries the amalgam bodily before it. If a round point be used around margins, there will be an uncondensed portion of filling in the V-shaped space between the margins and the matrix. It should be clearly understood that

amalgam cannot be condensed into a space where a plugger point cannot enter; lack of observation and knowledge of this fact accounts for rough margins and leaky fillings. The packing should be toward the periphery, and the softer amalgam should be removed as it works to the surface. This soft amalgam should be scooped out and more original material added, packed, scooped out, and added until the cavity is full. In this manner we secure perfect adaptation, thorough condensation, and a filling with all surplus mercury expressed.—THOS. PAISLEY WILLIAMS, *Texas Dental Journal*.

Some Pointers on the Manipulation of Plaster of Paris.—Everything that crystallizes does so by a law unto itself—and that law peculiarly shapes the crystals to fit each other and thereby form a given mass solidly. Disturb that law and you thwart the chemical purpose. Stir water after it begins to freeze and you have rotten, "mushy" ice. Stir plaster after crystallization begins, and you break the crystals and make air-interstices between the broken particles. These vacancies fill with various liquids and gases, which create disturbing compounds, till you have a rotten mass that becomes distorted under moisture, heat, and pressure. You may then lay the misfit of the plate to a bad impression instead of to the real cause. To make the most solid mass, plaster should be mixed to full saturation, and not stirred after the first perceptible show of hardening. A hard cast does not always mean a solid one.—J. W. GREENE, *Western Dental Journal*.

The Active Germicidal Properties of Carbolic Acid.—Probably the most discussed of all our remedies is carbolic acid. Among other things it has been accused of blocking its own action by coagulating the albumin in the tubuli. Professor Miller shows that bacteria penetrate the tubuli about 1/250 of an inch, so that the coagulation would not have to be very deep in order to be effective. As a matter of fact we do not deal with albumin in the putrescent canal, but albuminous liquids, which are entirely different substances. While carbolic acid coagulates normal egg albumin, it will not coagulate decomposing egg albumin. It has been proved by a number of investigators that carbolic acid when sealed up with normal albumin penetrates to every part. Dr. Dhingra says that the addition of a little hydrochloric acid to carbolic caused it to rapidly destroy spores that resisted the carbolic alone. This addition discolors the carbolic too much for use in root-canal treatment. Professor Cruikshank found—and this is recent testimony—that 1:40

parts of carbolic destroyed streptococcus and staphylococcus, and that 1:400 is an antiseptic. Dhingra says: "Klein, in recent experiments, finds carbolic acid, corrosive sublimate, and sulfuric acid the most efficient germicides."—*Western Dental Journal*.

Monochromatic and Polychromatic Inlays.—When the inlay is made of one color no great difficulty arises, but if it be composed of two or three colors, care must be taken to have one color extend only to where the other commences. Do not let one color lap the other even the least bit, for it will have a bad effect. For instance, if the neck of the inlay is yellow and the tip blue, do not let the blue lap the yellow, or a green streak will run through the middle. The yellow must extend only to where the blue commences. On the other hand, it is well to remember that if a touch of green is wanted in the inlay, a little blue over yellow will give it. It is a poor rule that does not work both ways.—E. F. LEWIS, *Dental Office and Laboratory*.

Inlays, Gold and Porcelain, and Where to Use Them.—I am not sure that I have a lasting operation with a gold inlay unless I have it well anchored in an occlusal dovetailed slot; and if the occlusal surface be not involved and crushing force does not need to be considered, then, from the standpoint of beauty, a porcelain inlay is to be preferred. I do not look askance on the thin line of cement, but prefer, except in the anterior teeth, in cavities of ordinary size, the gold filling that has served us so well for a long period of years, reserving for gold inlays those large cavities with frail walls, not only to avoid the drain on the nervous system of operator and patient incident to the insertion of a gold filling, but also because the inlay will not spread as a large gold filling will, thereby fracturing the wall of the tooth. In such cases the use of a gold inlay will give efficient service. This inlay must be embedded in a good body of cement, and whenever it is possible, the use of the rubber dam, to insure cleanliness and freedom from moisture, enhances the value of the operation.—JOHN A. SCHMIDT, *Items of Interest*.

Local Anesthesia in Dental Operations.—I find that the best way to inject the solution is to place the fingers in the sulcus between cheek and gum, and stretch the cheek away from the gum sufficiently to render the mucous membrane taut at its attachment or reflection. It is thin and firm enough, under moderate traction, to be punctured easily, choosing a spot opposite the point of oper-

ation, at about one-eighth of an inch from the jaw. I find the parts are loose enough to allow 10 minims of fluid to be injected (as many as 15 or 20 can be accommodated, although this is rarely necessary) without its escaping after removal of the needle. I disapprove of puncturing the gum, as it is too adherent to the bone, and fluids diffuse in it with difficulty; and, with many punctures, there is increased risk of its sloughing, besides being too painful to many nervous patients. I find I can obtain complete local anesthesia by puncturing in the way described, and using half a grain of pure cocaine hydrochlorid [see note] dissolved in 10 minims of lukewarm boiled water. I find the powdered drug the best to use. A shorter needle is not

so convenient, as the hand is too close to the mouth and blocks the view; also in the short needles the bore is too small to allow of its being cleaned with a fine wire and a shred of cotton, and if bent it always clogs at the bend. I use fifteen per cent. lysol solution for sterilizing the syringe. I have worked with this method and the same syringe for two and a half years, and am satisfied with its usefulness in daily practice in a country where gas and the major anesthetics are not always available.—*PERRY FURNIVALL, Brit. Journ. of Dental Science.*

[Note.—This dose is excessive and dangerous; the amount of cocaine to be injected in the mucous membrane should seldom if ever exceed one-eighth grain.—Ed.]

OBITUARY.

DR. FREDERICK BRADLEY.

DIED, at Newport, R. I., October 23, 1907, after a long and painful illness, **FREDERICK BRADLEY, D.M.D.**

Dr. Bradley was born at Huddersfield, Yorkshire, England, October 28, 1849, and was a son of Henry and Ann (Beaumont) Bradley. He came to the United States when a boy, and for several years thereafter was engaged as fine-drawer and inspector in the woolen manufacture at Dedham, Mass. His work in the woolen mill not satisfying his ambition, he entered the Harvard Dental School in 1884, and was graduated in 1886. The following year he associated himself with his brother, Dr. Thomas Bradley, in the practice of dentistry, and moved to Newport, R. I. There he continued in practice with his brother for a few years, and then alone, until ill health rendered it impossible for him to do further work. In 1893 he was made an instructor in operative dentistry in the Harvard Dental School, and continued in that capacity and as lecturer on the same subject until June 1906, when on account of failing health he was compelled to relinquish this phase of his professional activity.

Dr. Bradley held membership in many professional organizations. He had been president of the Harvard Dental Association, the Harvard Dental Club of Rhode Island, and

the Rhode Island Dental Society. In addition, he was at first an associate member, and later a fellow, of the New York Institute of Stomatology, and treasurer and president of the American Academy of Dental Science.

Becoming interested in the affairs of the city of Newport, in 1897 he was elected a member of the school committee, and at the expiration of his first term was elected for another period of three years. He was also a member of the committee on industrial school for six years, the last year as its chairman; and for two years chairman of the "committee on teachers" of the school committee.

Dr. Bradley was a man of marked artistic tendencies, who devoted many of his leisure hours to the beautifying of his home. He was particularly fond of flowers, and the grounds about his house gave evidence of the incessant care which he bestowed upon them. He was an accomplished musician, and as member and president of the Philharmonic Society did much to help the cause of good music in Newport.

Dr. Bradley leaves a widow and two children—a son, Dr. Frederick H. Bradley, who resides in Plymouth, Mass., and a daughter, Miss Emily M. Bradley, a teacher in the Newport public school.

SOCIETY NOTES AND ANNOUNCEMENTS.

INSTITUTE OF DENTAL PEDAGOGICS.

THE fifteenth annual meeting of the Institute of Dental Pedagogics will convene in the St. Charles Hotel, New Orleans, La., December 31, 1907, and January 1 and 2, 1908. All teachers in dental colleges are respectfully requested to attend this meeting, for which the following program has been prepared by the Executive Committee:

PROGRAM.

1. President's Address. J. H. Kennerly, St. Louis. Discussion opened by A. G. Friedrichs, New Orleans, La., and H. E. Friesell, Pittsburg, Pa.

2. Report of Commission on Nomenclature. S. H. Guilford, Philadelphia, Pa. Discussion opened by J. D. Patterson, Kansas City, Mo., and C. R. Turner, Philadelphia, Pa.

3. "Recitation Teaching in Orthodontia." Calvin S. Case, Chicago, Ill. Discussion opened by S. H. Guilford, Philadelphia, Pa., B. E. Lischer, St. Louis, Mo., and C. R. Jackson, Indianapolis, Ind.

4. "A Method of Teaching Technical Operative Dentistry." A. E. Webster, Toronto, Ont. Discussion opened by D. M. Cattell, Nashville, Tenn., H. T. Smith, Cincinnati, Ohio, Byron H. Stout, Taunton, Mass., and H. M. Seamans, Columbus, Ohio.

5. "The Teaching of Prosthetic Dentistry." Walter M. Bartlett, St. Louis, Mo. Discussion opened by R. M. Sanger, East Orange, N. J., Hart J. Goslee, Chicago, Ill., Ellison Hillyer, New York city, and H. P. Magruder, New Orleans, La.

6. "Teaching Operative Dentistry and Dental Pathology." Harry B. Tileston, Louisville, Ky. Discussion opened by D. M. Gallie, Chicago, Ill., L. M. Waugh, Buffalo, N. Y., and S. F. Foster, Atlanta, Ga.

7. "A Method of Teaching Dental Ceramics." W. L. Fickes, Pittsburg, Pa. Dis-

cussion opened by W. M. Randall, Louisville, Ky., C. K. Buell, Buffalo, N. Y., and W. F. Lawrenz, St. Louis, Mo.

8. "The Didactic Teaching of Dental Anatomy, Embryology, and Histology." C. D. Lucas, Indianapolis, Ind. Discussion opened by William Bebb, Los Angeles, Cal., F. B. Noyes, Chicago, Ill., and C. L. Babcock, Milwaukee, Wis.

9. Report of Master of Exhibits. F. C. Friesell, Pittsburg, Pa.

10. Report of Master of New Teaching Facilities. N. T. Yager, Louisville, Ky.

B. E. LISCHER, *Sec'y and Treasurer*,
St. Louis, Mo.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE thirty-fifth annual meeting of the American Dental Society of Europe will be held in London, England, beginning July 31, 1908. Notice is given thus early that American practitioners may include this meeting in their European itinerary.

Any information will be gladly given by writing the undersigned.

J. W. GALE, *Hon. Sec'y*,
79 Hohenzollern-Ring, Cologne, Ger.

OHIO STATE DENTAL SOCIETY.

THE forty-second annual meeting of the Ohio State Dental Society will be held in the assembly rooms of the Great Southern Hotel, Columbus, December 3, 4, and 5, 1907.

An excellent program of papers, clinics, and exhibits has been prepared. The educational features of such a gathering can be appreciated only by those who are in regular attendance at this and other leading societies, and every ethical dentist of the state should

come, and if not already a member, should join.

Should you wish to stop at the Great Southern Hotel it would be well to have your rooms reserved, as there are never accommodations for all—however, other first-class hotels are in the immediate vicinity. Mark the dates off now, and come on the first day and remain through the entire session.

F. R. CHAPMAN, *Sec'y*,
Columbus, Ohio.

ANGLE SCHOOL OF ORTHODONTIA ALUMNI SOCIETY.

THE second annual meeting of the Alumni Society of the Angle School of Orthodontia will be held in St. Louis, Mo., December 12, 13, and 14, 1907.

MARTIN DEWEY, *Sec'y*,
Argyle bldg., Kansas City, Mo.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

THE annual clinic of Northwestern University Dental School will be held at the school, corner of Lake and Dearborn sts., Chicago, on Tuesday, January 14, 1908. A hearty invitation is extended to all graduates and ethical practitioners.

H. E. HARRISON, *President*,
GEO. R. PUFFER, *Sec'y*.

NEW YORK COLLEGE OF DENTISTRY.

TO THE ALUMNI.

ANY alumnus seeing this notice is kindly requested to send his name, address, and year of graduation, to the undersigned.

For the Alumni Association of the N. Y. C. D.,
MAURICE GREEN, D.D.S.,
1190 Lexington ave., New York, N. Y.

G. V. BLACK DENTAL CLUB OF ST. PAUL.

THE G. V. Black Dental Club of St. Paul will hold its annual midwinter clinic in February 1908. It is our intention to make this meeting the most interesting and profitable of any we have ever held.

A cordial invitation is extended to the members of the profession to attend, and as-

sist us in making this meeting the best that has ever been held in the Northwest. Dates and program will be published later.

For further information address

R. B. WILSON, *Sec'y*,
Amer. Nat'l Bank bldg., St. Paul, Minn.

CHICAGO COLLEGE OF DENTAL SURGERY ALUMNI ASSOCIATION.

THE annual meeting of the Alumni Association of the Chicago College of Dental Surgery will be held in the college building on Wednesday, January 15, 1908. It is hoped that there will be a large attendance, especially of graduates of the college.

T. L. GRISAMORE, *President*,
H. C. PEISCH, *Sec'y*.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY.

THE regular monthly meeting of the Odontotechnique Society of New Jersey will be held Thursday, December 5, 1907, at the Elks Club, 37 Greene st., Newark, N. J. The paper of the evening will be read by Dr. Thos. E. Weeks, on a subject to be announced.

At the January meeting, Thursday, January 2, 1908, Dr. D. A. Webb of Scranton will read a paper entitled "Malignant Growths of the Jaw: Fractures, etc."

JOHN A. VOORHEES, *Journal Correspondent*,
Newark, N. J.

IDAHO BOARD OF EXAMINERS.

THE Idaho State Dental Board will meet in Boise, December 26, 27, and 28, 1907. Applicants must bring operating instruments and engine.

E. S. BURNS, *Sec'y*,
Boise, Idaho.

COLORADO BOARD OF EXAMINERS.

EXAMINATIONS granted to holders of diploma only. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any states. Examination the first Tuesday of December, at Denver.

HOWARD T. CHINN, *Sec'y*,
307 Mack bldg., Denver, Colo.

PENNSYLVANIA BOARD OF EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburgh, December 10 to 13, 1907. For papers or further information applicants must address

N. C. SCHAEFFER, *Sec'y*,
Harrisburg, Pa.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the State-house, at Trenton, N. J., beginning Monday, December 9, 1907, and continuing through the 10th and 11th. Practical operating and practical prosthetic work will begin 8 A.M. Monday. Photograph and preliminary credentials must accompany the application.

For full information address

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

KENTUCKY BOARD OF EXAMINERS.

THE Kentucky State Board of Dental Examiners will meet for the examination of applicants at Louisville, on the first Tuesday in December 1907, at The Masonic, at 9 A.M.

Each applicant shall deposit with the secretary his or her recent photograph, with signature on the reverse side, both of which shall be certified to by the dean of his or her graduating college, or other parties acceptable to the board. Applicants must be graduates of reputable dental colleges.

Applicants shall be examined in the following subjects: Anatomy, Physiology, Materia Medica, Pathology, Histology, Operative Dentistry, Oral Surgery, Chemistry, Metallurgy, Prosthetic Dentistry, Crown and Bridge Work, Oral Hygiene, and Dental Prophylaxis.

Every applicant shall be required to insert two gold fillings; two amalgam fillings; impression, bite, and articulating teeth of upper or lower denture; one bridge on model,

consisting of one shell and one Richmond crown and two porcelain-faced dummies; one gold or porcelain inlay or Logan crown—all to be done before the board.

A general average of 75 per cent. is required. Applicants will be graded upon a basis of three-fifths on practical work and two-fifths on theory.

Applicants must come prepared with instruments, engine, and material, excepting bellows, blowpipe, lathe, stones, and polishing cones. The board would advise the use of gold in the above bridge, as it would cost very little more than German silver after disposing of the bridge.

Application for examination must be made upon blanks furnished by the board and must be accompanied by a fee of twenty dollars, and must be filed with the secretary ten days before the date of examination.

J. RICHARD WALLACE, *Sec'y*,
Louisville, Ky.

NEW HAMPSHIRE BOARD OF REGISTRATION.

THE next meeting of the New Hampshire Board of Registration in Dentistry for examinations will be held December 3, 4, and 5, 1907, at Masonic Banquet Hall, Manchester, N. H.

A. J. SAWYER, *Sec'y*,
Manchester, N. H.

IOWA BOARD OF EXAMINERS.

THE Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, December 2, 3, and 4, 1907. Written and practical examination will be required. For further information address

E. D. BROWER, *Sec'y*,
Le Mars, Iowa.

TEXAS BOARD OF EXAMINERS

THE Texas State Board of Dental Examiners will hold the next semi-annual examination at Waco, Texas, December 16, 1907. For further information address

BUSH JONES, *Sec'y*,
Dallas, Texas.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS.

THE semi-annual examination of the Board of Dental Examiners of the District of Columbia, will be held January 2, 3, and 4, 1908.

All applications for examination must be accompanied by a fee of ten dollars, and should be filed with

WILLIAM B. DALY, *Sec'y*,
1340 New York ave., N. W., Washington,
D. C.

SOUTH DAKOTA BOARD OF EXAMINERS.

THE next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., Tuesday, January 14, 1908, beginning at 1.30 P.M. All persons desiring to take this examination must make application to the secretary, and send fee of \$10.00 at least one week prior to the above date. No candidates will be received for examination who do not make application as above specified. Applicants are required to

bring dental engine, filling materials, articulators, teeth, and all appliances necessary to do crown and bridge work.

G. W. COLLINS, *Sec'y*, Vermillion, S. D.

ARMY DENTAL CORPS.

DENTAL Surg. Robert M. Hollingsworth will proceed to Iloilo, Panay, for assignment to duty. (Sept. 11, Phil. D.)

Dental Surg. Harold O. Scott will proceed to Camp Stotsenberg, Pampanga, for duty. (Sept. 7, D. Luzon.)

Dental Surg. Samuel W. Hussey will proceed at the expiration of his present leave to Fort Snelling, Minn., for duty. (Oct. 23, W. D.)

The following medical officers and contract dental surgeons are assigned to the stations set opposite their respective names for duty: First Lieut. Bernard S. Gostin, assistant surgeon, to Camp Connell, Samar; Contr. Dental Surg. Robert M. Hollingsworth, to Camp Downes, Leyte; First Lieut. William H. Richardson, assistant surgeon, to Camp Joasman, Guimaras. (Sept. 18, D. V.)

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1907.

October 1.

No. 867,264, to C. S. EVANS. Dental implement.

October 15.

No. 868,109, to J. MORRIS. Method or process of making artificial teeth.
No. 868,628, to E. M. FLAGG. Dental regulator and spacer.

October 22.

No. 868,964, to H. D. BULTMAN. Crown pin for dental work.

No. 869,035, to W. C. WOLFORD. Dental instrument.

No. 869,191, to G. W. MORGAN. Dental plate.

October 29.

No. 869,417, to F. W. CHANDLER. Stone-guard for dental grinding tools.

No. 869,520, to M. A. ROBBINS. Dental impression pliers.

No. 869,562, to J. F. HARDY. Dental engine.

No. 869,563, to J. F. HARDY. Handpiece for dental engines.

No. 869,840, to W. E. HANSON. Dental engine.

INDEX TO VOLUME XLIX.

1907.

- ABBOTT, C. EDSON**, "Porcelain Inlay in Approximo-Incisor Restoration in Anterior Teeth, with Special Reference to Strength" (clinic), 163
- Abdominal operations**, some factors which contribute to success in, 1814
- Abraded surfaces**, restoration of, by means of inlays, 395
- Abrasion**, a purely mechanical process, 246
acid auto-intoxication the cause of, 1225
caused by the action of the tooth-brush and powder, 225
experiments and observations on, by W. D. Miller, 1, 109, 225, 677
susceptibility of different grades of teeth to, 15
- Abrasion and chemico-abrasion**, treatment of, 245
- Abcess**, alveolar, complications of, 702, 705
diagnosis by means of radiograph, 302
discharge of, simulating nasal catarrh, 704
- Abcesses**, apt to occur at any period of life, 920
discharging into the nasal cavity, difficulty of diagnosing, 920
extraction of teeth the seat of, 1211
infection from, may pass into the alimentary canal and lungs, 920
of dental origin, opening outside the mouth, 919
pointing of the pus in, a case illustrating, 919
subacute, infection from, 920
- Absorption and resorption**, 501
- Abulcasis**, the originator of systematic dental prophylaxis, 496
- Abutment preparation**, rubber-dam method of, 484
- Accidents of anesthesia**, treatment of, 1099
- Acetonuria**, 1230
- Acid auto-intoxication**, treatment of, 1233
- Acid auto-intoxication and systemic disease** the cause of erosion and abrasion, 1225
- Acidity of the urine**, conditions which change the degree of, 1231
the cause of, 1297
- Acid substances**, solutions of, in water, more active on tooth-structure than solutions in saliva, 116
- Acids**, action of, upon the hard tooth tissues, 113
alone, do not produce wasting, 122
or acid bodies in chemico-abrasion, 226
or acid salts, combined with mechanical action, effect upon teeth, 116, 877
powerful, action of vapors of, on the inorganic and organic constituents of tooth tissue, 113, 246
which decalcify dentin more rapidly than they do enamel, 113
- Acme forceps**, the, for backing plate teeth and facings, 580
- Aconite tincture**, strength of, 212, 842
- Acquired atrophy of the maxillæ**, 1208
- Actinomycosis**, a case of, 769
of the cheek, a case of, cured by potassium iodid, with suggestions as to the possible means of infection and spread of the disease, 527
- Acute and chronic suppurations**, treatment of, with carbolic acid, in combination with gum camphor, 90
- Acute median otitis** in connection with dentition of childhood, 554
- Adenoids and mouth-breathing** in the causation of malocclusion, 820, 1181
- Adhesive gold filling**, advantages of, 988
- Adrenalin and cocaine** for pressure anesthesia, 511
- Adults**, retention of deciduous teeth in, 921
- Ainsworth, Geo. C.**, "A Compound Bicuspid or Molar Filling, Using the Matrix and Soft or Semi-cohesive Gold at the Cervical Wall, Extending Up Two-Thirds of the Filling, and Finishing with Cohesive Gold under the Mallet" (clinic), 162
- Air**, compressed, in orthodontia, 1076
outfit for, 722
use of, in office and laboratory, 722
- Air-chambers**, evil results of, 1212
method of obtaining stability of upper plates without the use of, 1005
- Alabama Board of Dental Examiners**, 431
- Alabama State Dental Association**, announcement, 428
- Allen, H. J.**, "Lymphatic Stimulation in Dental Practice," 305
- Alopecia**, two cases of, confirmatory of Jacquet's theory, 877
- Alum**, dried, physical properties of, 941
- Aluminum washers**, 416
- Alumni Association of Chicago College of Dental Surgery**, announcement, 105
- Alveolar abcess**, treatment through the alveolar process, 95
- Alveolar infections**: extraction vs. retention, 708
- Alveolus**, normal and pathological, difference between, 301
treatment of, following extraction of infected root, 739
treatment of, following extraction of tooth with abcess, 399
- Amalgam**, best filling material for badly broken-down teeth, 956
in posterior teeth, 1105
manipulation of, 96, 881, 1105, 1814
reliability of, 327
restoration by, to improve occlusion, 955
- Amalgam and gold fillings** that have come out from cavities in a lump, how to reinsert them, 393

- Amalgam crown, gold, or gold and platinum, cemented linings for, 1157
technique of placing, 937
- Amalgam fillings, use of cement under, 60
wearing away of, by abrasion, 16
- Amalgam restorations vs. gold crowns, 530
technique of, 328
- Amalgam war, the, 1062
- Amalgamation, clean, how to produce, 956
- Amaurosis, a case of, consecutive to the extraction of a tooth, 875
- American Dental Club of Paris, abstract report of meetings held in 1905 and 1906, 753, 985, 1090
- American Dental Society of Europe, announcement, 105, 1317
- American Medical Association, Section on Stomatology, announcement, 541
- American Society of Orthodontists, announcement, 332
- Amphoteric Reaction (editorial), 404
- Amphoteric reaction, 677
- Amputation of dead roots of molars in the preparation of bridge abutments, 1107
- Anchor bands, 196
- Anchorage, Jackson's method of, 1264
- Anchorage pins for large porcelain restorations, 1214
- Anchoring of gold inlays in occlusal surface, 1210
- Anema, R., "The Orthodontia of Today from the Standpoint of the Orthodontist," 986
- Anesthesia, historical data on the discovery of, 1062
local, by spraying with refrigerants, 1041
local, in dental operations, 1315
pressure, in the removal of living pulps, 505
treatment of accidents of, 1099
with nitrous oxid, preparation of the patient for, 1146
with nitrous oxid and oxygen, cases in practice, 1144
- Anesthetic, dentist the best judge as to when it should be administered, 558
- Anesthetic combination for patients with constitutional disorders, 1144
- Anesthetics, general, action of, 412
- Anesthetizing the pulp, methods of, 1006
- Angle School of Orthodontia Alumni Society, 1113
- Angle, the, classification of malocclusion, 1129
- Animals, wasting of the teeth of, not rare, 688
- Annealing of platinum, 1210
- Anterior tooth, missing, unique method of supplying, 153
- Antidote for carbolic acid, 1211
- Antiseptic treatment of pathological conditions of the oral mucous membrane, 1132
- Antiseptics, list of, 580
- Antiseptics and disinfectants, 579
- Antal disease, alveolar opening in, 916
an ancient method of treating, 916
drainage tube in the treatment of, objections to, 916
extension of, by gravity, from one cavity to another, 974
futility of injecting antiseptic fluids in the treatment of, 916
- Antral suppuration, acute, danger in neglect of, 915
acute, frequent causes and symptoms of, 909
acute, prognosis of, 915
acute, sensitiveness of the teeth in, 911
cases of, cured without any dental treatment, 910
chronic, always a sequela of an acute case, 914
chronic, difficulty of diagnosis, 910
- Antral suppuration, chronic, not necessarily due to diseased teeth, 910
nasal irrigations in, advantages of, 913, 917
obstinate, operation in treatment of, 918
of dental origin, 912, 915
of nasal origin, general congestion of the mucosa in, 912
operations for the cure of, 917, 918
swelling of the face in, 911
- Antrum, blind, a case of, 914
- Apex, resection of, 1313
- Appliance for moving incisors outward, 344
for retention of retruded lower labials, 25
- Applications in inflammatory conditions of the mouth, advised by early practitioners, 561
- Approximo-occluding surfaces, dovetail extension in, 1035
- Approximo-occlusal cavities extending under gingival margins, suitable for porcelain inlays, 434
- Arch, appliance for expanding, 194, 196
conditions demanding the expansion of, 1263
- Arch bar, a time-saving attachment for, 1280
- Arch expansion, age at which it is most effective, 1263
- Arches, shortening of, by loss of permanent teeth, 1155
- Argyrol for pus pockets, 645
- Aristol and zinc oxid in root-canal work, 1193
- Arizona Board of Dental Examiners, 336, 1023
- Arkansas Board of Dental Examiners, 224
- Arkansas State Dental Association, announcement, 222
- Army and Navy Dental Legislation (editorial), 1301
committee on, of National Dental Association, 170
(correspondence), 1266, 1303
- Army Dental Corps, 106, 430, 676, 798, 907, 1113, 1224, 1320
- Army medical museum and library, 169
- Arsenic, carrying of, to cavity, avoiding the use of pressure, 1004
cementing, 95
for the devitalization of pulps, history of the introduction of, 1040
use of, in pulp-devitalization, 941
- Arsenic trioxid, 842
- Art and science, relation of, in dentistry, 1108
- Arterio-sclerosis in the etiology of pyorrhea alveolaris, 749
- Articulating artificial teeth, Dr. Bonwill's work on, 1062
- Articulation, definition of, 374, 994
- Articulator, anatomical, reasons for its use, 200
- Artificial denture, death from swallowing, 325
preparatory work in, 1107
use of flexible rubber in the retention of, 648
- Artificial induction of phagocytosis in the treatment of infection, 1101
- Artificial larynxes, 877
- Astringents on the mucous membrane, effect of, 1028
- Atkinson on tooth-saving, 968
- Atlanta Dental College, commencement of, 1111
- Audibran, Joseph, work of, 322
- Autogenous soldering, 501
- Auto-intoxication the constitutional cause of pyorrhea alveolaris, 812
- BABCOCK, E. HOWARD, "Report of Committee on Practice" (New York State Dental Society), 50
- Bacon, Elbridge, obituary of, 651

- Bacteria in the oral cavity, rapid growth of, 944
on tooth-structure, causes leading to the accumulation of, 1073
which constantly inhabit the mouth, 1069
- Bacterial infection, Wright's rules for therapeutic applications in cases of, 572
- Bacteriology of pyorrhea, observations on, 878
- Baker, Chester A., "A Method of Constructing Crowns for the Anterior Teeth," 578
- Baker, Geo. T., "Demonstration of Use of Thy-moform: (a) Permanent Root-Fillings; (b) Disinfecting Dressing for Infected Pulp-canals; (c) Mummifier" (clinic), 68
- "Orthodontia" (clinics), 163, 1179
- Baltimore College of Dental Surgery, commencement of, 659
- Baltimore Medical College, Dental Department, commencement of, 779
- Banded crowns, incorrect adaptation at gum margin, 742
opinions on the value of, 270
vs. the bandless, 270
- Bands, invisible, for the correction of irregularities, 196
- Bands, caps, and crowns, making of, without solder, 884
- Barker, Lewellys F., "Anatomical Nomenclature," review of, 410
- Barnes University, Dental Department, commencement of, 657
- Barrett, Thomas J., president's address (North-eastern Dental Association), 835
- Baskin, Eldridge, "Method of Overcoming the Contraction of High-Fusing Porcelain" (clinic), 588
- Baumgardner, Ira G., "Method of Taking Impressions for Porcelain and Gold Inlays by Means of Strips of Aluminum in Connection with Dental Lac," 454
- Beach, J. W., "Saliva Analysis to Determine the Presence of Potassium Sulfo-cyanates" (clinic), 1179
- Beck, C. S., memorial resolutions on the death of, 101
- Bedside dental treatment, methods and equipment for, 99
- Beedle, C. D., "A Bridge, Using S. S. White or Justi Diatoric Teeth for the Facings, and Gold Inlays for the Abutments" (clinic), 163
- Belcher, William W., "The Use of Compressed Air in the Office and Laboratory," 722
- Bennett, Allan G., "Recreations for the Dentist, with Some Basic Requirements," 1255
- Beren's operation for the cure of cleft palate, 918
- Best, Harrison D., "A System of Crowning and Bridging by the Aid of a New Crown," 1245
- Bethel, Herbert H., "A Method of Repair that Can Successfully be Applied to Some Cases of Fractured Bridge or Crown Facings," 280
- Betts, Ralph N., obituary of, 217
- Bicuspid shell crown by the casting process, 1252
- Bicuspid, liability to fracture of buccal cusps of, 743
rotation of, 1265
- Billmeyer, U. D., obituary of, 217
- Bite, methods for the opening of, 345, 460
taking the, 213, 1008, 1106
- Black, G. V., banquet to, announcement, 104
- Black stains caused by silver nitrate, to remove from the skin, 1313
- Blaker, C. S., "Porcelain Inlays" (clinic), 197
- Bland antiseptics, use of, in treatment of antral empyema, 977
- Bleeding of the gum, excessive, due to a misfitting crown, 1047
- "Blind abscess," 701
- Blood serum, importance of, in relation to resistance against disease, 572
- Blue light and heat as therapeutic agents, 281
- Blue rays in therapeutic dentistry, 824
- Blunt burs, pain caused by, in cavity preparation, 556
- Bones of the face, report of a case of extensive injury to, 262
- Bonwill on the overbite, 992
- Boston and Tufts Dental Alumni Association, 1113
- Bourdet, one of the three dentists of Louis XV, 1234
- Bowles, Shirley W., "A New Adaptation of the Microscope to Dentistry," 358
"A Method of Making and Recording Porcelain Shades" (clinic), 590
- Bradley, Frederick, obituary of, 1316
- Brain, effect of nitrous oxid and oxygen on, 1142
- Bread, quality of, its relation to the frequency of caries, 214
- Brewster, Richard C., resolutions of regret on death of, 1218
- Bridge, anchoring of, in a gold or amalgam filling at each end, failure resulting through, 1107
resetting of, without removing it from the mouth, where one of the anchorage points is loosened, 215
to replace broken facing on, 162
with diatoric teeth for the facings and gold inlay for the abutments, 163
with telescoping crowns, 157
- Bridge and crown repairing, 280
- Bridge abutments, amputation of dead roots of molars in the preparation of, 1107
- Bridge attachment, a method of, 161
- Bridge repairing, a substitute for pin facings in, 1161
- Bridges, how to invest, 489
porcelain, and pinless crowns, 197
removable, with gold inlay abutments, saddle and vulcanite attachments, 154
setting, with gutta-percha, 248, 453
to prevent bending of, 197
- Bridge work, by the Taggart casting process, 1165
diatoric teeth in, 163, 197, 1213
injudicious use of, 962
in pyorrhea, 248, 514
method of forming cusps for perfect occlusion in, 1006
- Bright's disease, oral manifestations of, 1294
- Brinkman, M. R., "A Simple Method of Replacing Broken Facings on Crowns and Bridges" (clinic), 68
- Broaches, root-canal, a method of handling and sterilizing, 417
- Broomell, I. N., "Does the Cemented Filling Preserve Tooth-Structure Better than the Filling Inserted Without Cement?" 616
- Brown, G. V. I., "Cleft Palate—Surgical" (clinic), 162
- Bruxomania, gritting of the teeth, 525
- Bryan, Lyman C., "Silver Nitrate and Preventive Dentistry," 1090
"The F. D. I. Commission on Hygiene," 366
"Thoroughness in Dentistry," 753
- Buccal mucous glands, acid secretion from, the cause of erosion, 1297
- Buccal mucous membrane, hyperesthesia of, 1000
- Bugbee, N. P., "A Method of Bridge Attachment" (clinic), 161

- Burkhart, A. P., "Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation," 484
- Burnished gold fillings, 938
- failures in, 961
- Burnished joint for porcelain crowns, 883
- Burnishing gold plate to a tooth, 1106
- Burns, W. A., "Quick Method of Repairing Porcelain Facings in the Mouth" (clinic), 56
- Butler, Chas. S., "The Educational Problem," 172
- Byram, J. Q., "The Present Status of the Porcelain Inlay," 483
- CABILL, WM. H., resolutions on the death of, 66
- Calcium carbonate, effect on teeth of brushing with, 109
- Calcium chlorid as a hemostatic, 529, 1009
- Calcium phosphate, acid, action upon tooth-structure, 280
- Calcuil, removal of, to reduce the pain incident to, 212
- California Board of Dental Examiners, 224, 336
- Call for an International Mass Meeting of Dentists, announcement, 105
- Camphor in the technique of matrix burnishing, 435
- Cancer, early diagnosis of, 726
- Cancer-growth and bacteria, similarity in the tissue irritation caused by, 727
- Canine, forcing eruption of, 268, 492
- upper, pain in, caused by pressure on supra-orbital branch of the fifth nerve, 127
- Canines, retarded eruption of, 266
- rotation of, 1265
- Canker sore mouth, remedy for, 645
- "Cap backing," 1246
- Capon, Wm. A., "High-Fusing Porcelain Carving" (clinic), 198
- Carbohydrates, energy producers in the animal organism, 810
- Carbolic acid, action of, upon tooth tissue, 113
- antidote for, 1211
- as a disinfectant, 580
- germicidal properties of, 1315
- in combination with gum camphor in the treatment of acute and chronic suppurations, 90
- use of, prior to the application of cocaine for pressure anesthesia, 511
- Carbon dioxid, rôle of, in the causation of urinary acidity, 1298
- Carbonic acid, action upon dentin, 226
- action upon teeth, 115
- solutions of, in saliva and in water, action on enamel, 805
- Carbon system of constructing a porcelain-face crown, 516
- Carborundum stones, cementing of, 745
- in cavity preparation for inlays, 1118, 1162
- Carcinoma of the mouth, 642
- Caries, dental, during pregnancy, 1104
- electrolytic theory of, 1041
- Fauchard's conception of, 1239
- frequency of, in relation to the quality of bread used, 214
- influence of systemic conditions on certain serious complications of, 210
- prevalence of, 837
- Carr, I. N., "Combination Filling of Tin and Gold" (clinic), 512
- Case, Calvin S., "Rise and Development of Intermaxillary Force," 443
- "Supplementary Retaining Forces as Auxiliaries to Labial Retaining Appliance," 23
- Cast, definition of the term, 458
- hints to avoid placing it wrongly on the articulator, 212
- Cast fillings, how to contour, 468
- Cast gold inlays, description of Taggart's technique, 1120
- Cast gold inlays and tips, 775
- Casting appliances, 1251
- Casting process in crown and bridge work, 1251
- Catarrh, chronic laryngeal, and diseases of the teeth and gums, connection between, 555
- Cattle, wedge-shaped defects in the teeth of, 688
- Caustic potash solution, action on dentin, 238
- Cavities, approximo-incisal, in anterior teeth, preparation of, for porcelain inlay, 163
- extending under the gum, preparation of matrix for, 533
- for inlays, method of obtaining impressions of, 49, 831
- for which gold inlays are indicated, 1008
- lower cervical, filling of, with gold, without the rubber dam, 57
- preparation of, 154, 829, 1105, 1163
- sensitive, preparation of, 212
- sensitive, treatment of, 99, 218
- shallow erosion, to relieve sensitivity of, 648
- small, on posterior teeth, how to fill, 48
- Cavity, method of adapting matrix to, 650
- Cavity lining, cement, the placing of, 939
- paste of English wood creasote and zinc oxid as a, 623
- Cavity preparation, fundamental principles of, 478
- for gold inlays, 418, 646, 818, 1005, 1034, 1110
- for porcelain inlays, 434
- pain in, caused by blunt burs, 556
- sharp angles to be avoided in, 958
- the matrix as an aid in, 729
- Cavity preparation and formation of matrices for porcelain inlays, 1215
- Celluloid, early views on, 1042
- Cement, adaptation of, to cavity walls, 648
- as an aid in the insertion of gold fillings, 147
- in combination with absorbent cotton as a sealing dressing, 880
- in relation to color in porcelain inlays, 437, 439
- mixing of, 419
- preservation of, 645
- sticky, as a cavity lining, 939
- under gold and amalgam fillings, 60, 1157
- use of, for swaging gold inlay matrices, 1004
- Cement adhesion, the cause of failure in inlay work, 823
- Cemented filling, the, 1121
- Cemented fillings, advantages of, 618
- in deep-seated cavities, 625
- packing and finishing of, 326
- Cement film, to diminish, at marginal joint of inlays, 830
- Cement line of inlays, permanence dependent upon minimum thickness, 418
- Cement lining for combination fillings, 937
- Cement-mixing, slab for, 745
- Cement slab, to clean, 880
- Cementation in crown and bridge work, 484, 487
- Central incisor, method of supplying, when tooth on each side is sound, 744
- Chalk, prepared, effect of its vigorous use upon the teeth, 14
- prepared, roughness of washings of, 109
- Charity work, dental, 1281
- Chase, W. G., "Porcelain Bridges and Pinless Crowns" (clinic), 197
- Chemical substances which attack dentin and enamel, 112
- Chemico-abrasion, 2

- Chemico-abrasion, no specific acid concerned in the production of, 246
- Chest, shoulder, and arm exercise, 1259
- Chicago College of Dental Surgery, commencement of, 887
- notice to alumni, 1318
- Chicago Odontographic Society, announcement, 480
- Children's teeth, investigations as to the condition of, 565
- preservation of, 1212
- selection of filling material for, 881
- treatment of, 881
- "Chirurgen-dentiste (Le)," by Pierre Fauchard, 1237
- Chitosamin, 230
- Chittenden's investigations on food and diet, 810
- Chloroform water as a hemostatic, 416
- Chloro-percha, treatment of the gum with, before setting a crown, 1212
- Chloro-percha and aristol in root-canal work, 1194
- Chondroitin and chondrosin, 1028
- Chromium dioxide, 842
- Cincinnati College of Dental Surgery, commencement of, 888
- Clack, W. R., "Gold Filling" (clinic), 515
- Clamp, use of floss silk in placing, 1004
- Clasp, the partial, 1264
- for partial plates, the best, 645
- the spring, 1265
- Clasp metal, casting of, 1169
- Clasps, bent-wire, 97
- Clay, S. T., "A New Appliance for Spreading the Upper Arch" (clinic), 194
- Cleaning files, 95
- Cleft palate, surgical treatment of, 162
- Clinton, Marshall, "The Early Diagnosis of Cancer," 726
- Close of the Volume (editorial), 1306
- Coakley, Cornelius G., "The Diagnosis and Treatment of Antral Suppuration," 909
- Cocain, properties of, compared with those of novocain and alypin, 827
- systemic effect of, during pressure anesthesia, 510
- Cocain adrenalin, advantages of, 557
- intra-dental anesthesia by means of extra-dental injections of, 822
- method of using and preparation of, 557
- precautions in the use of, 558
- when its use is indicated, 558
- Cocain injection, danger of, 556
- Cocain poisoning, fatality and danger of treating with morphin, 413
- Cocain solution for pressure anesthesia, 507
- Cocainization of the inferior dental nerve for the painless extraction of mandibular teeth, 321
- Code (The) of Dental Ethics (editorial), 315
- Coe, I. J., "The Use of Cement under Gold and Amalgam Fillings" (clinic), 60
- Cohesive gold for dental operations, discovery of, 1041
- College of Oral and Dental Surgery of New York, commencement of, 782
- College of Physicians and Surgeons, Dental Department, commencement of, 889
- Colloid degeneration, 1028
- Color as related to porcelain inlays, 437
- Colorado Board of Dental Examiners, 1116
- Colorado College of Dental Surgery, commencement of, 658
- Colorado State Dental Society, announcement, 429
- Colored lights, specific action of, 825
- Colors, the primary, 487
- Combination filling of gold and porcelain, 1127
- Compensating curve, meaning of the term, 458
- Comparative wearing of fillings and tooth-substance, 17
- Compressed air, for removing the matrix in inlay work, 985
- use of, in pulp-removal, 984
- use of, in the office and laboratory, 722
- Concerning Dental Libraries (editorial), 635
- Condensation of gold, 494
- Condyle's path, to determine direction of, 99
- Congenital fistule of the lower lip, 209
- Congenital malformation of the mouth, 210
- Connecticut Dental Commissioners, 431, 1115
- Connecticut dental law, changes in, 948
- Connecticut State Dental Association, announcement, 106, 426, 672
- clinics, 67, 1179
- officers for 1907, 1089
- president's address, 947
- proceedings of, 62, 946, 1074
- Constantini, C. L., "Antiseptics and Disinfectants," 579
- Contour and occlusion obtained with cast fillings, without waxing or investing, 468
- Contouring cast fillings, 468
- Contract dental surgeons, status of, 562
- Contraction and expansion of plaster, 419
- Conzett, J. V., "Gold Filling" (clinic), 516
- Cook, Geo. W., "The Degeneration of Tissue, with Special Reference to the Oral Mucous Membrane," 1025
- Co-operation in dentistry, 730
- Copper used in orthodontic appliances, antiseptic qualities of, 944
- Corley, J. P. (chairman), "Report of the Committee on Oral Hygiene" (National Dental Association), 292
- Correction, a, 407, 999, 1097
- Cotton, to trim and sterilize, 1313
- Creasote, therapeutic value of, in root-canal treatment, 1008
- Crelighton University, Dental Department, commencement of, 784
- Crosby, A. W., "President's Address" (Connecticut State Dental Association), 947
- Crossland, J. H., "Prophylaxis a Factor in Dental Education," 503
- "Stomatic Prophylaxis" (clinic), 514
- Crouch, F. G., "Orthodontia" (clinic), 518
- Crown, a bandless Richmond, 882
- amalgam, advantages of, 937
- amalgam, technique of placing, 937
- a new, system of crowning and bridging by the aid of, 1245
- Baker's, for the anterior teeth, 578
- construction of, without solder, 884
- for bridge teeth, 214
- hollow-pin, in bridge work, advantages of, 1250
- inset into the substance of the tooth, 691
- open-face, method of using gold inlay in making, 1007
- porcelain, and root, to make a perfect joint between, 198
- porcelain-face, 516
- porcelain, for molars, 161
- shell or banded, injuries resulting from defective adaptation of, 690
- shell, reinforced porcelain-face, 57
- shell, setting of, 1005
- the burnished cap, 273
- the half-cap, 273
- the Williams, 273
- whose band remains invisible, 646
- Crown and bridge work, 1205
- by the casting process, 1251
- failures in, from faulty technique, 1106
- traumatic lesions incident to, 1046

- Crown outfit, the Bütner, 741
 Crowns, banded and half-banded, opinions on the relative value of, 270
 for pyorrheal teeth, 514
 gold, how to obtain correctly occluding cusps for, 197
 how to invest, 459
 pinless, 197
 ready-made porcelain, vulnerable points of, 272
 setting with gutta-percha, 453
 Cryer, M. H., "Some Abscesses of Dental Origin which Open Outside the Mouth," 919
 Crystal gold, in combination with gold foil, method of inserting, 95
 to avoid chopping up, 645
 Cudworth, W. H., "Porcelain Inlay Restoration of a Central Incisor" (clinic), 513
 Curtis, I. C., "Fifty Years of Dental Science with Its Fads and Foibles," 1040
 "Cuspid," 458
 Cusps, difference in the shape of, 853
 in bridge work, method of forming, for perfect occlusion, 1006
 for bridge teeth, 212
 for gold caps, a way to obtain, 197
 perfectly swaged, 212
 Cutting, A. J., "A Process of Burnishing Gold" (clinic), 67
 Cysts, of the oral cavity, 70
 pericemental or radicular, 700
- DALL's method of porcelain inlays, 82
 Dameron, E. P., "Oral Hygiene in the State Association," 313
 "The Use of the Interchangeable Facings" (clinic), 513
 Davenport, W. S., "Surgical Treatment of a Deformed Maxilla," 929
 Davis, Edwin E., "A Unique Method of Supplying a Missing Anterior Tooth," 153
 Davis, L. F., "Use of Vulcanite Pinless Teeth in Crown and Bridge Work," (clinic), 590
 Dawson, H. D., "Method of Lateral Bicuspid Attachment in Bridge Work, Preserving the Buccal Tooth-Wall" (clinic), 590
 Death following extraction of teeth, 712
 from suppurating sockets of teeth, 711
 from swallowing an artificial denture, 825
 Deciduous teeth, erythrophlein hydrochlorid in the treatment of, 89
 question as to preservation of, 1004
 resorption of, effect of hypoauidity upon, 922
 retention of, in adults, 922, 923
 retention of, in tubercular subjects, examination of patients at White Haven Sanatorium to determine, 922
 Defective nasal breathing, influence of, on growth and development, 531
 Deformed maxilla, surgical treatment of, 929
 Degeneration, colloid, 1028
 experimental, of the oral mucous membrane of dogs, 1072
 meaning of, 1025
 mucoid, 1027
 of oral mucous membrane, 1025
 through lack of stimulation, 1070
 Delaurent, dentist to Henry IV, 1234
 Dennis, Samuel W., obituary of, 651
 Dental arch, definition of the term, 458
 Dental charity work, a word of warning concerning, 1281
 Dental clinic, free, inestimable value of, 950
 Dental conditions, relation of, to pulmonary tuberculosis, 92
 Dental disorders caused by an exclusive lactal diet, 91
 Dental dispensary, objections to, 953
 Dental ectopy and nasal suppuration, 413
 Dental education, manual training an essential to, 469
 of the public, 560, 737, 837
 prophylaxis a factor in, 503
 remarks on, 172, 1087
 sources of, 598
 Dental features of civil service reform, case illustrating the value of, 561
 Dental hemorrhage, treatment of, 1202
 Dental histology, problems in, 76
 Dental infirmary of Portland, Me., 1281
 Dental instrument-making, 590
 Dental Instruments Included in Surgical Equipment of Russian Warships (correspondence), 284
 Dental journalism, Wm. H. Trueman on, 466
 Dental law, new, for Pennsylvania, 653
 Dental library of Springfield, Mass., 1283
 Dental Libraries, Concerning (editorial), 635
 Dental licenses, interchange, of, in Canada, 179
 Dental meeting, educational influence of the, 724
 Dental origin of three cases of systemic infection, 1098
 of certain reflex ocular disturbances, 1308
 Dental papers, preparation of, 1148
 Dental pathology, some odd cases in, 647
 Dental profession, an appeal to the younger men of the, 859
 remarkable history of, and splendid character of men who helped to build it up, 495
 Oliver Wendell Holmes on, 562
 Dental Schools, Instance of Endowment of (correspondence), 283
 Dental science, fads and foibles of fifty years of, 1040
 Dental services in public institutions, necessity for, 325
 Dental societies in New England, statistics on, 1080
 Dental society, a postgraduate school, 736
 Dental Society of the State of New York, announcement, 222, 427
 clinics, 56
 president's address, 1050
 proceedings of, 43, 1050, 1192, 1291
 report of Committee on Fellowship Medals, 1084
 report of Committee on Practice, 50
 Dental text-book, first teachings of, 1238
 Dental therapeutics, the blue ray in, 824
 Dental vital statistics, 882
 Dentifrices, 528
 Dentin, acids which decalcify it more rapidly than enamel, 113
 action of carbonic acid upon, 228
 action of solution of hydrogen dioxid and caustic potash upon, 238
 desensitizing, a word of warning as to, 1211
 effect of heat on, 238
 effect of zinc oxyphosphate upon, 617
 opacity of, 439
 secondary, 748
 sensitive, prescription for obtunding, 328
 Dentin and enamel, chemical substances which attack the inorganic constituents of, 112
 Dentinal hyperesthesia, perhydrol (hydrogen dioxid) in its treatment, 97
 Dentist, how he should be educated, 74
 protection for, against specific infection, 1007
 recreation for the, 717

- Dentist should possess a general knowledge of pathology, 963
the term defined, 1282
- Dentistry, advance of, 562
as an independent profession, foundation of, 1079
co-operation in, 730
historical data on, 1040
operative and prosthetic, advance in, 72
qualifications essential for the practice of, in Germany, 599
relation of art and science in, 1108
representation of, in the Pharmacopœial Convention, 845
thoroughness in, 753
- Dentistry, the Position of (editorial), 1093
- Dentists and the International Medical Congress (editorial), 761
- Dentists as calkers, 622
as school commissioners, 564
election of, to board of health, 954
historical data in regard to, 947
need of daily physical exercise for, 1256
number of, in New England states, 1080
should instruct patients in oral hygiene, 560
the early Arabian, 496
- Dentists, Stomatologists, and International Medical Congresses (correspondence), 766
- Dentition, permanent, absence of, 753
- Denture, metal, how to make an accurately fitting, 57
normal deciduous, spaces between incisors and canines, 1175
partial, lodgment of, in the esophagus, 1000
temporary lower, 518
- Dentures, artificial, method of making, 385
partial lower, successful, 419
- Denudation of hard tooth-structure, experiments and observations on, 1
- Detroit College of Medicine, Department of Dental Surgery, commencement of, 544, 887
- Detroit Dental Society, announcement, 222
- Devitalizing paste, 1216
- Devitalizing pulps, 96
- Diabetics, degree of urinary acidity in, 1227
- Diagnosis, methods of—the exploring needle and the X ray, 97
- Diagnosis and treatment of antral suppuration, 909
- Diatric teeth in bridge work, 163, 197, 1213
- Dieffenderfer, W. E., "Difficult Impressions" (clinic), 584
- Die metal for modeling-compound impressions, 1004
- Dies, amalgam, of tooth-cavities, 1125
- Diet, relation of, to interstitial gingivitis, 808
vegetable, in pyorrhea alveolaris, 1192
- Difficult eruption of a permanent canine, 772
- Digestion, impairment of, by caries, 955
- Dills, W. B., "Gold Inlays," 40
- Dionis, Pierre, anatomist and surgeon, 1234
- Diplococcus pneumoniae in pericemental infection, 710
- Direct intermaxillary retention, 27
- Discussion on "Acid Auto-Intoxication and Systemic Diseases the Cause of Erosion and Abrasion," 1291
on "A Discussion of the Merits and Demerits of the Gold Inlay," 395
on "Administration of Kéïène and Extraction" (clinic), 587
on "Alveolar Infection: Extraction vs. Retention," 738
on "A Method of Overcoming the Contraction of High-Fusing Porcelain" (clinic), 588
- Discussion on "An Appeal to the Younger Men of the Profession," 860
on "And They Say 'Comparisons are Odious,'" 1088
on "A New and Accurate Method of Making Gold Inlays," 1168
on "Antiseptic Treatment of Pathological Conditions of the Oral Mucous Membrane," 1186
on "A Practical Talk on Orthodontia," 62
on "Burnished Gold Fillings," 958
on "Comments on General Practice," 492
on "Co-operation in Dentistry," 734
on "Cysts of the Oral Cavity," 70
on "Dental Education," 601
on "Difficult Impressions" (clinic), 584
on "Does the Cemented Filling Preserve the Tooth-Structure Better than the Filling Inserted Without Cement?" 618
on "Errors in Dental Education," 71
on "Extensive Gold Inlays and Their Application to Bridge Work," 740
on "Extraction of Teeth a Surgical Procedure," 898
on "Fifty Years of Dental Science, with Its Fads and Follies," 1060
on "Forcing Eruption: a Case in Practice," 491
on "Gold Inlays," 48
on "Hygiene Maintained During the Progress of Orthodontia," 1074
on "Lymphatic Stimulation in Dental Practice," 309
on "Non-union of Double Fracture of the Mandible Successfully Treated after a Lapse of Two Months," 735
on "Opening the Doors of Dental Knowledge to the People," 1280
on "Operative Dentistry," 188
on "Oral Hygiene in Public Schools and Institutions: What are We Going to Do About It?" 609
on "Orthodontia" (clinic), 587
on "Orthodontia and Orthopedia of the Face," 1287
on "Orthodontia as a Prophylactic Measure," 387
on "Orthodontia as Applied to the Extraction of an Impacted Third Molar" (clinic), 589
on "Orthodontia: Opening the Bite in the Regulation of the Teeth: a Metal Flange for Improving the Anchorage of Appliances, Moving Teeth, and for Harmonizing the Occlusion," 480
on "Our Old Standbys," 955
on "Phases of Art in Prosthesis," 379
on "Pharmacopœial Revision," 604
on "President's Address" (Connecticut State Dental Association), 952
on "President's Address" (Northeastern Dental Association), 839
on "Pressure Anesthesia' and the Removal of Living Pulp," 510
on "Preventive Medicine," 1286
on "Prosthetic Nomenclature," 500
on "Reflected Shadows Accompanying Porcelain Fillings," 490
on "Report of Committee on Dental Medicine" (Massachusetts Dental Society), 1182
on "Report of Committee on Dental Practice" (New York State Dental Society), 52
on "Report of Committee on Operative Dentistry" (union meeting at Washington), 615
on "Restoration of Gum Tissue on the Labial Aspect of Teeth," 591

- Discussion on "Rubber-Dam Method of Abutment Preparation, Interchangeable Facings, and Cementation," 488
- on "Setting Crowns and Bridges with Gutta-Percha," 490
- on "Some Abscesses of Dental Origin which Open Outside the Mouth," 967
- on "Some Thoughts Concerning the Contact of the Teeth," 383
- on "The Aging of the Tissues, with Special Reference to Given Forms of Dental Abnormality and Disease," 748
- on "The Blue Light and Heat as Therapeutic Agents," 286
- on "The Correction of Facial Inharmonies," 852
- on "The Degeneration of Tissue, with Special Reference to the Oral Mucous Membrane," 1070
- on "The Diagnosis and Treatment of Antral Suppuration," 972
- on "The Early Diagnosis of Cancer," 980
- on "The Educational Influence of the So-Called 'Dental Meeting' Apart from Its Professional or Social Value," 735
- on "The Educational Problem," 177
- on "The Human Skull Used as a Grathodynamometer to Determine the Value of Trituration in the Mastication of Food," 605
- on "The Loss of Teeth in Childhood, and Its Effect on Occlusion and the Face," 1174
- on "The New Pharmacopoeia," 845
- on "The Orthodontia of Today from the Standpoint of the Orthodontist," 988
- on "The Porcelain Rod in Dentistry," 43
- on "The Present Status of the Porcelain Inlay," 475
- on "The Relation of Diet to Interstitial Gingivitis," 1191
- on "The Remarkable History of the Profession and the Splendid Character of the Men of the Past who Helped to Build It Up," 498
- on "The Treatment and Filling of Root-canals," 1192
- on "The Use of Compressed Air in the Office and Laboratory," 984
- on "The Value of Association," 1053
- on "Thoroughness in Dentistry," 759
- on "Traumatic Lesions Incident to Crowns and Bridges," 1068
- on "Treatment of Pyorrhea Alveolaris," 298
- on "Wanted!—A Pathological Sense," 962
- Diseased tooth-root, complications from, 972
- Diseases, systemic, oral manifestations of, 1293
- Disinfectant, the ideal, 579
- Disinfectants, list of those in use, 580
- steam and boiling water as, 580
- Disinfectants and germicides, interchangeable terms, 580
- Disinfection of the mouth, 415
- process of, 579
- Disinfection and sterilization, distinction between, 579
- Displaced tooth in the nasal cavity, causing fetid vomiting, 883
- Distal Cavities in Deciduous Second Molars (correspondence), 1049
- District of Columbia Board of Dental Examiners, 107, 552, 1320
- District of Columbia Dental Society and Maryland State Dental Association, union meeting, 582, 740
- president's address, 582
- response to president's address, 583
- Dobell's solution in the treatment of antral empyema, 978
- Doctor, origin of the term, 212
- Dogs, defects in the teeth of, 686
- Dolphin (Globicephalus globiceps), defect in the teeth of, 683
- Donnegan, E. J., "Repairing Continuous Gum Gum Sections, and Facings" (clinic), 197
- Dorland, W. A. Newman, "The American Pocket Medical Dictionary," review of, 875
- Doskow, Samuel, "The Banded vs. the Bandless Crown," 270
- "The Retention of Deciduous Teeth in Adults," 921
- Double resection of the mandible, case of, 1002
- Doubleday, A. W., "Combination Inclined Plane and Retaining Appliance" (clinic), 159, 515
- Drew, F. F., "Dental Education," 598
- Drugs, duty of dentists to become familiar with properties of, 577
- table giving list of some recently made official (U. S. P.), 576
- table giving (U. S. P.) purity standard of, 575
- table of recent changes in terminology of (U. S. P.), 575
- Dubois-Foucou, dentist to four kings of France, 1234
- "Dummy," meaning of the term, 458
- Dunning, W. B., "Manipulation of Non-Cohesive Gold on the Wedging Principle" (clinic), 67
- Dunwoody, J. E., "A Way to Obtain Correctly Occluding Cusps for Molar Caps" (clinic), 197
- EARLY treatment of malocclusion, 932
- Eastern Indiana Dental Association, announcement, 427
- Eczema of the lip and the rôle of certain mouth-washes in its etiology, 321
- Editorial Prerogative (editorial), 869
- Education and Memorizing (editorial), 519
- Educational Problem (The) (editorial), 202
- Eighth District (N. Y.) Dental Society, union meeting with Seventh District (N. Y.), 780, 980
- Electric annealer for gold foil, advantages of, 532
- Electric sleep, 1215
- Electric action in the mouth as a cause of wasting (erosion), 244
- Elements, radium emanation and transmutation of, 1216
- Ellis, Walter H., "Duplication of Models" (clinic), 69
- Empyema of the antrum of Highmore, proper drainage essential to, 973
- of the maxillary sinus in the new-born, 644
- Enamel, acids which decalcify it more rapidly than dentin, 113
- action of brush and powder on, slower than on dentin, 9
- action upon, of carbonic acid solutions, in water and in saliva, 805
- chemical substances which attack, 112
- susceptibility of, to the action of gritty tooth-powder, 12
- Enamel rods, arrangement of, 440
- Endelman, Julio, "On the Pathology of Pericemental Inflammations," 695
- Engine, dental, the beginning of, 1240
- Engine handpieces, sterilization of, 416
- Englert, G. A., "Anesthetization of the Dental Pulp in the Presence of Pulp-Nodules and Other Obstinate Conditions" (clinic), 58

- Epithelial debris theory of radicular cyst development, 701
 Epithelioma of the lip cured by the X ray, 1003
 Epithellum of the mouth, 1132
 Erosion (abrasion), wasting of the teeth, conclusions on the etiology of, 246
 acid auto-intoxication the cause of, 1225
 agency of certain acid substances produced by the labial glands in causation of, 228
 as caused by acid secretion from buccal mucous glands, 1297
 as observed in the teeth of workmen in dynamite manufactories, 114
 electrical action in the mouth as a cause of, 244
 etymology of the term, 1
 experiments and observations on, 1, 109, 225, 677
 following severe illness, 228
 in pregnant women, 1295
 mucic acid theory of, 225
 not produced by acids alone, 122
 reaction of the saliva in fifty-two cases of, 227
 relation of rheumatism, gout, and gastric disturbances to, 235
 relation of, to diabetes, tabes, and parietic dementia, 1226
 silver nitrate in the treatment of, 1091
 so-called, at necks of the teeth, is frequently abrasion, 592
 the electrolytic theory of, 2
 treatment of, 1226
 Truman's investigations on, 1226
 (wasting), action of ferments in the production of, 244
 W. D. Miller on, 1, 109, 225, 677
 Erosion and abrasion, causes of, 1226
 treatment of, 245
 Eruption of canine, forcing of, 268
 Erythrophlein chlorid, uses of, in dentistry, 1008
 Erythrophlein hydrochlorid in the treatment of deciduous teeth, 89
 Esophagus, lodgment of partial denture in the, 1000
 Etching of inlays, 1126
 Ether or chloroform, danger of repeated inhalations of, 557
 Ethics, journalistic, a question of, 82
 Ethics, The Code of (editorial), 315
 Ethyl chlorid, opinions on the safety of, 1147
 Etiology of dental irregularities, 357
 of erosion, abrasion, wasting of the teeth—conclusions on, 246
 of tooth-gemination, 879
 Evans' gutta-percha cement, 488
 Evans, Thomas W., reception of, by Napoleon III, 561
 Evolution, 75
 Examination of the teeth of school children, 949
 necessity for, 612
 Exercise, chest, shoulder, and arm, 1259
 Expanded arches, retention of, 24
 Expansion of plaster-of-Paris casts, and its compensation by the contraction of zinc dies, 327
 of plaster, to prevent, 416
 of the arch, appliances for, 196
 Extension for prevention not always a wise procedure, 965
 Extensive perforation of the soft palate, a case of, cured by medicinal means, 770
 Extraction, a surgical procedure, 354
 destruction of type a consequence of, 933
 during inflammation, views against, 709
 during pericementitis and alveolar abscess, opinions on the question of, 713
 Extraction during the menstrual period, danger of, 740
 followed by death, 712
 for the correction of malocclusion, 25
 fractured teeth in, 398
 generally necessary in the treatment of diseased antrum, 976
 in orthodontia, 853
 is it indicated in double protrusion? 1130
 loss of a portion of jaw-bone following, 355
 of infected root, treatment of alveolus following, 789
 of retained deciduous teeth not an advisable procedure, 923
 vs. retention in alveolar infection, 708
 FACE-BOW, 200
 Faces, frequency of abnormal types of, 931
 Facial inharmonies, appendix to article on, 930
 correction of, 850
 Facial neuralgia caused by irritation of the pulp from mechanical abrasion, 1002
 Facing, broken, to replace on bridge in the mouth, 162
 removable, 517
 repairing of, 197
 Facings, attaching to caps with porcelain, 325
 broken, a simple method of replacing on crowns and bridges, 68
 change in color of, a result of soldering, 487
 interchangeable, 513
 porcelain, quick method of repairing in the mouth, 56
 Fahnestock, W. B., "A Simple Method of Making Gum Sections with Prosthetic Porcelain for Partial Dentures and Removable Bridges" (clinic), 58
 Failures in crown and bridge work resulting from faulty technique, 1108
 resulting through anchoring a bridge in a gold or amalgam filling at each end, 1107
 Fauchard, Pierre, historical data on, 496
 Chas. McManus on, 1233
 Ferments, action of, in the production of tooth-wasting, 244
 Ferris, H. Clay, "Antiseptic Treatment of Pathological Conditions of the Oral Mucous Membrane," 1132
 "Hygiene Maintained during the Progress of Orthodontia," 943
 Flaschi, P., "Report of a Case of Extensive Injury to the Bones of the Face and of a Case of Post-Typhoid Osteomyelitis of the Mandible," 262
 Fifth District (N. Y.) Dental Society, announcement, 426
 Fifth nerve, destruction of, preservation of deep sensitivity of the face after, 876
 Files, sharpening, 1106
 Filling, adhesive gold, advantages of, 938
 adhesive gold, method of inserting, 939
 cemented and non-cemented, 616
 for root-canals, 509
 of cement and mat gold, 626
 of gold and cement, 621
 Filling materials—for nervous patients, 883
 factors to be considered in selecting, 880
 for children's teeth, 881
 relative tooth-saving properties of, 1122
 Filling root-canals, the immediate method, 1193
 with gold, 1194
 with tin points, 1193
 Fillings, amalgam and gold, wearing away of, 16
 cast, method of obtaining contour of, without waxing or investing, 468

- Fillings, cause of failure of, 1158
 cemented, 1122
 combination, failures in, from the use of too much cement, 937
 gold, cooling of, during finishing, by means of compressed air, 723
 gold, pronounced wasting of, 225
 methods of retention of, 362
 wearing down of, 232
 Filter, a quick, 1313
 Finley, M. F., "Orthodontia" (clinic), 586
 "President's Address" (National Dental Association), 165
 First Australian Dental Congress, announcement, 382
 First District Dental Society of the State of New York, proceedings of, 390, 972
 First French Congress of Stomatology, announcement, 382
 First molar, disturbances accompanying difficult eruption of, 1206
 Fissures, cutting out, 1006
 Fistulae, congenital, of the lower lip, 209
 facial and submental, the outcome of neglected pericemental infection, 703
 Fitting crowns and making inlays, 516
 Flanagan, A. J., "And They Say 'Comparisons are Odious,'" 1078
 Flexible rubber in the retention of artificial dentures, 648
 Flint, D. W., "The Loss of Teeth in Childhood, and Its Effect on Occlusion and the Face," 1153
 Florida Board of Dental Examiners, 550
 Florida State Dental Society, announcement, 548
 Flower, James Oliver, obituary of, 217
 Flush-joint crown, technique of, 691
 Flux for soft soldering, 1210
 Fluxes, the rôle of, in porcelain work, 436
 Follicular cyst of the mandible, a case of, 1101
 Food and diet, Chittenden's investigations on, 810
 Forceps, apply them carefully and thus avoid serious mishaps, 214
 Forceps and root-pincers devised by Fauchard, illustrations of, 1242
 Forces, supplementary retaining, as auxiliaries to labial retaining appliances, 23
 Formaldehyd, physical properties of, 942
 Formalin and Tricresol in Combination in the Treatment of Putrescent Pulp (correspondence), 158, 284
 Formalin as a disinfectant, 581
 Foster, Sir Michael, obituary of, 329
 Fourth International Dental Congress, announcement relating to final report of the committee on organization, 168
 Fracture of the lower jaw across the neck of both condyles, 644
 Fractured mandible, an interesting case of, 91
 Free dental service in the public schools, 565
 benefits to be derived from, 566
 proposition for securing, in Manila, 567
 Frink, C. H., "Porcelain Restoration of Malformed and Diminutive Laterals" (clinic), 513
 Furfurol in the saliva, 1028

 GANGRENE of the mouth (cancrum oris): its cause, evolution, and treatment with methylene blue, 1311
 Gastric disturbances, relation of, to wasting (erosion) in tooth-substance, 235
 Gastro-intestinal sanitation an aid to successful treatment of nose, throat, and ear diseases, 554

 Gates-Glidden drill, broken, removal of, 96
 Gay, Frederick P., "Preventive Medicine," 1136
 Geer, Sidney L., obituary of, 420
 Gelatinous plaques (Black's), 1029
 Gemination, dental, 879
 Georgia State Dental Society, announcement, 333
 Georgetown University, Dental Department, commencement of, 891
 Gerrish, C. H., "Napkins and Cohesive Gold Foil" (clinic), 159
 Glands (Black's) of the pericementum, 697
 Glandular cysts, 70
 Glass, action of tooth-paste containing talc on, 109
 Glass solder, a, 412
 Glycerin, physical properties of, 942
 Glycerin and rose-water, 325
 Glycogen, chemistry of, 1026
 Glycogenic infiltration, 1026
 Gold, a process of burnishing, 67
 as a root-canal filling, 1194
 cohesive and non-cohesive, as filling material, 614
 cohesive and semi-cohesive, combination filling of, 162
 condensation of, 494
 for filling teeth, first record of, by Giovanni d'Arcoli, in 1450, 496
 how to tip facings with, 773
 in small cavities in posterior teeth, 48
 moss fiber, annealing of, 939
 non-cohesive, for filling cervical portions of large cavities, 187
 non-cohesive, manipulation of, on the wedging principle, 67
 non-cohesive, tooth-saving qualities of, 496
 pure, in inlay work, 817
 temperature at which it boils, 647
 Gold and amalgam fillings, 60
 Gold and platinum matrices, compared, 50
 Gold and porcelain, combination filling, 1127
 inlays of, and where to use them, 1315
 Gold and tin, combination filling, 164
 Gold crown, amalgam restorations better than, 530
 not a permanent operation, 936
 Gold filling, 515, 516
 Gold fillings, Black's tests on specific gravity of, 621
 burnishing of, 940
 case illustrating abrasion of, 16
 cooling of, during finishing, by means of compressed air, 723
 in children's teeth made easy, 1105
 method of procedure in, 959
 perfect, new and easy method of making, 146
 pronounced wasting of, 225
 repairing, 1106
 use of cement under, 60, 147
 wearing away of, by abrasion, 16
 Chas. H. Jaco on, 195
 Gold foil annealing, what it really is: advantages of the electric annealer, 532
 Gold inlay—"don'ts," 1006
 hollow, 42, 195, 199, 515
 hollow reinforced, 395
 merits and demerits of, 392
 of crystal gold, how to make, 394
 simple method of making a, 1106
 technique of, 396
 Gold inlay abutments for removable bridges, 154
 Gold inlays, 40
 cases in which they are indicated, 53, 1008, 1108
 cavity preparation for, 646, 1005
 extensive, and their application to bridge work, 690

- Gold inlays in compound cavities of molars involving the mesio-occluding and disto-occluding surfaces, 1034
 methods of making, 647, 649, 1117
 solid, technique of, 818
- Gold inlays and fillings, comparative value of, 53
- Gold, or Gold and Platinum, Cemented Linings for Amalgam and Gold Fillings (correspondence), 1157
- Gold scrap, purifying of, 1179
- Goodwillie, James, obituary of, 651
- Gorgas, Herbert F., "A Demonstration of the Acme Forceps for Backing Plate Teeth and Facings" (clinic), 590
- Gorman, J. A., "Orthodontia" (clinic), 512
- Gout, relation of, to wasting (erosion) of tooth-substance, 235
- Grady, Richard, "Opening the Doors of Dental Knowledge to the People," 1270
 "Oral Hygiene in Public Schools and Institutions: What Are We Going to Do About It?" 559
- Grape and orange cure, deleterious effect upon the teeth, 230
- Grayson, C. P., "The Teeth in Relation to Ear and Throat Diseases," 553
- "Great Thomas," the, 1234
- Greenough dissecting binocular microscope, adaptation of, for dentist's work, 358
- Grippe as the cause of pseudo-odontalgia, 999
- Griswold, G. M., "Burnished Gold Fillings," 938
- Gritman, A. D., "Why an Anatomical Articulator Should be Used" (clinic), 200
- Grits in conjunction with tooth-brushes, effect upon the teeth, 1291
- Grittling of the teeth (bruxomania), 525
- Gullford, S. H., "An Appeal to the Younger Men of the Profession," 859
- Gum, structure of, 1046
 treatment of, with chloro-percha, before setting a crown, 1212
- Gum camphor combined with paraffin for packing inlay matrices, 51
- Gum recession, frequently a normal process, 597
 surgical treatment of, 755
- Gum-resin euphorbium, prevention of rusting by means of, 640
- Gum sections for partial dentures and removable bridges, a simple method of making, 58
 repairing of, 197
- Guthymol, 1216
- Gutta-percha for filling teeth, 1005
 for setting crowns and bridges, 453
 preserving qualities of, 490
 to hasten the solution of, in chloroform, 416
- Gutta-percha cement, setting crowns and bridges with, 326
- Gutta-percha solution, 453
- G. V. Black Dental Club (St. Paul)—Clinic, announcement, 103, 1318
- Gymnastics, the basis of, 1258
- HALE, C. WESLEY, "Adapter for Abscess Syringe," 159
- Half-cap crown, arguments for and against, 273
- Hall, Alexander, "Non-Union of Double Fracture of the Mandible Successfully Treated After a Lapse of Two Months," 728
- Hall, J. A., "A Temporary Lower Denture" (clinic), 513
- Handpiece, care of the, 773
- Hand sterilization, 946
- Harlan, A. W., "The Blue Light and Heat as Therapeutic Agents," 281
- Harmony in facial lines, definition of, 934
- Harper, H. D., obituary of, 101
- Harris, C. C., "Report of the Committee on Operative Dentistry" (union meeting at Washington), 613
- Hart, John I., obituary of, 885
 resolutions of regret on death of, 1218
- Harvard Dental School, commencement of, 993
- Head, Joseph, "Dr. Miller's Observations on the Wasting of Tooth Tissue, variously Designated as Erosion, etc., Viewed in Their Relation to the Power Possessed by Saliva of Controlling Acid Decalcification," 801
 "The Repair of Porcelain Fillings, 369
 demonstration on resemblance between natural tooth-color and underlying stratum of the skin, 591
- Hearing and vision, disturbances of, as complications of pericemental infection, 703
- Hemoptysis, spurious, 641
- Hemorrhage, dental, treatment of, 1202
 severe, following extraction of a lower molar: treatment of, 524
- Hemorrhagic conditions, injection of fresh serum in, 641
- Hemostatic, calcium chlorid as a, 529, 1009
 chloroform water as a, 416
- Heredity in the study of malocclusion, 851, 853
- Heyke, J. E., "Purifying Scrap Gold" (clinic), 1179
- Hicks, F. B., "Orthodontia Appliances for Expanding the Arch and Regulating the Teeth" (clinic), 196
- High temperature, effect of, on teeth, 876
- Hints, some helpful, 416, 773
- Hirschfeld, Wm., "The Correction of a Misplaced Anterior Tooth by Means of Porcelain, 985
- Historical data on dentistry, 1040
- History of the U. S. Pharmacopeia, 840
- Hitch, D. M., "Invisible Bands for the Correction of Irregularities: also Anchor Bands" (clinic), 196
- Hodson, W. J., "Blue Ray in Therapeutic Dentistry," 824
- Hoefler, W. C., "Method of Making Hollow Inlays" (clinic), 199
- Hoffmeister, Edward, "Pharmacopoeial Revision," 573
- Hoge, defects in the teeth of, resembling wasting in human teeth, 686
- Hollow gold inlays, 42, 195, 199
- Homburger, L. M., "Gold Inlays" (clinic), 196
- Hopewell-Smith, A., "A Study of the Vascular Lesions of the Dental Pulp, Their Complications, and Clinical Significance," 124
- Horse, defect of the labial surfaces of the lower incisors, resembling wasting, 682
- Hosley, H. E., "Method to Prevent Shrinkage in Soldering Bridge Work" (clinic), 67
 "Why the Bridge Bonds, and a Method to Insure Success" (clinic), 197
- Howard University, Dental Department, commencement of, 888
- How's method of rod inlays, 33
- Hugo, L. C. F., "On Preparing Dental Papers," 1148
- Hyalin infiltration, 1027
- Hydrogen dioxide, blackening of the tongue caused by the use of, 1001
 solution of, action on dentin, 238
- Hydronephthol as a pulp-capping, 416, 773
- Hydronephthol mixtures as mouth-washes, 756
- Hygiene, maintained during the progress of orthodontia, 943
 the F. D. I. Commission on, 366

- Hyperesthesia of the buccal mucous membrane, 1000
- Hypertrophy of the gum caused by a bridge setting against the soft tissues, 1068
- Hypodermic syringe, use of, in high-pressure anesthesia, 1009
- Hypoplasia, a substitute for the term erosion, 1 meaning of the term, 2
- ICHTHYOL in the treatment of pericemental abscess, 529
- Idaho Board of Dental Examiners, 1223
- Identification by the shape of the palate, 774
- Illinois Board of Dental Examiners, 549, 1022
- Illinois State Dental Society, announcement, 427, 799
- Immediate root-filling, objection to, 645
- Impacted lower third molar lying against the second molar, wedging preparatory to extraction of, 774
- Impression, definition of the term, 459
- Impressible metal, of a single tooth, how to make, 1005
- of a soft and flabby mouth, to take, 98
- preparation of the mouth for: extraction, 774
- Impressions, difficult, 584
- difficult, an aid in the removal of, 773
- for full upper dentures, method of making by the use of modeling composition and plaster, 775
- for porcelain and gold inlays, method of taking by strips of aluminum in combination with dental lac, 454
- of cavities, 49, 774, 831, 1124
- of the mouth, attention to detail in, 649
- Impression-taking, 95, 1004
- Impression trays, to clean, 773
- Incisor, central, porcelain inlay restoration of, 513
- left lateral, malposed, regulation of, 986
- Incisors, elongation of, treatment of deformity caused by, 1090
- lower, appliance for depressing, 347
- lower, moving of, from labial to lingual occlusion, 344
- moving outward, appliances for, 344
- to separate, 1314
- upper, moving of, from lingual to labial occlusion, 344
- Inclined plane for moving forward lower anterior teeth, 159
- Indiana Board of Dental Examiners, 106, 432
- Indiana Dental College, commencement of, 657
- Indiana State Dental Association, announcement, 335
- Infantile scurvy, its manifestations and diagnosis, 768
- Infected root-canals, proteol in the treatment of, 1312
- Infection, artificial induction of phagocytosis in the treatment of, 1101
- secondary, from the oral cavity, ending in loss of life, 711
- specific, protection for the dentist against, 1007
- Infiltration, glycogenic, 1026
- hyalin, 1027
- mucoid, 1027
- Inflammation, definition for, 695
- extraction during, 708
- pericemental, of bacterial origin, 697
- phenomena of, 695
- remote consequences of, 702
- Inflammation lymph, 696
- Influenza, antral empyema frequently a sequence of, 975
- "Inlaid" crown, technique of, 692
- Inlay, covering with white porcelain its surface approximating a metal filling, 490
- gold, hollow reinforced, 395
- gold, technique of, 396
- large, cementing of, 742
- restoration of abraded surfaces with, 395
- shell gold, construction of, 1037
- solid, of pure gold, superiority of, 817
- to re-bake, 1211
- tube and post attachment for, 1037
- Inlay gold, method of using in making open face crown, 1007
- Inlay metal, 818
- Inlays, building in layers of different colors, 490
- cavity preparation for, 418, 434
- cementing of, without removing matrix, 477
- cement line of, permanence dependent upon general minimum thickness, 418
- etching of, 1126
- gold, abutment for removable bridge, 154
- gold, cases in which they are particularly indicated, 1108
- gold, extensive application of, in bridge work, 690
- gold, hollow, supported by platinum pins, 49
- gold, in compound mesio-occluding and disto-occluding surfaces, 1034
- gold, method of making, 647, 649, 1117
- gold and porcelain, and where to use them, 1315
- hollow, methods of making, 195, 199, 515
- monochromatic and polychromatic, 1315
- porcelain and gold, compared, 434, 646
- porcelain, by the impression method, 1123, 1125
- porcelain, cementing of, 1126
- porcelain, for approximo-incisal cavities in anterior teeth, 163
- porcelain, historical data on, 32, 1043
- porcelain, of high-fusing body, 198
- porcelain, removal of glaze of, 440
- porcelain rod, Dall's and other methods, 32
- porcelain rod and fused porcelain, difference between, 31
- swaged matrix for, 434
- with split pins and tube attachment, 154
- Inlays and tips of cast gold, 775
- Institute of Dental Pedagogics, 1221, 1316
- Instruments for cleaning teeth, method of making, 1189
- Intermaxillary force in orthodontia, Calvin S. Case on, 443
- Intermaxillary retention, 25
- International Association of Stomatology, 1219
- International Dental Federation, announcement, 423
- proceedings at Geneva, 1906, 472
- Interstate Dental Fraternity, announcement, 785
- Interstitial gingivitis, relation of diet to, 808
- Interstitial growth of mandible, 853
- Intradermal anesthesia, by means of extradermal injections of cocaine-adrenalin, 322
- Intradermal blood pressure, 127
- Inverted mandibular third molar, an, 1102
- Investing crowns and bridges, 326
- Investment plaster, 1005
- Iodin as a germicide, 213
- properties of, 945
- tincture of, in the treatment of fistule of dental origin, 1003
- Iodoform, liquid preparation of, 214
- physical properties of, 942
- Iothion, 1102

- Iowa Board of Dental Examiners, 107, 432, 1223
 Iowa State Dental Society, announcement, 428
 Iridio-platinum stays as retainers for gold fillings, 365
 Iron, rusting of, 520
 Iron preparations, action of, upon the teeth, 1103
 Irregularities, Fauchard on the correction of, 1242
 Invisible bands for the correction of, 196
 the three most prolific causes of, 857
 Irrigation of the antrum, precaution to be exercised during, 974
 It Hath "a Very Ancient and a Fishlike Smell" (editorial), 995
- JACKSON, A. M., "Contour and Occlusion Obtained with Cast Fillings without Waxing or Investing," 468
 Jackson, V. H., "Orthodontia" (clinic), 198
 "Orthodontia and Orthopedia of the Face," 1282
 "Orthodontia, Jackson System" (clinic), 515
 "Orthodontia: Opening the Bite in the Regulation of the Teeth: A Metal Flange for Improving the Anchorage Appliances, Moving Teeth, and for Harmonizing the Occlusion," 343
 Jackson's system in orthodontia, 62
 Jamestown Dental Convention, announcement, 102, 538, 791, 900, 1015
 Jarman, Albert W., "Crowns Without Solder, Bridges with and without Solder, and a Talk on Crown and Bridge Work," 1251
 Jaw, lower, fracture of, across the neck of both condyles, 644
 shortening of, by loss of first molar, 1156
 special forms of necrosis of, 319
 Jaws, tumors of, pathology and treatment of, 1099
 Johnson, H. Herbert, "A Review of the Methods Employed for the Retention of Fillings," 362
 "Forcing Eruption: A Case in Practice," 266
 Johnstone, A. P., "A New Method of Fitting Crowns and Making Inlays. Mounting Porcelain Crowns with Fixed or Detached Posts" (clinic), 516
 Joints, white, how to make, 1008
 Jones, E. C., "The Anesthetizer" (clinic), 196
 Junkerman, G. S., "Opsonium Applied to Pyorrhea Alveolaris," 570
- KANSAS Board of Dental Examiners, 549
 Kansas City Dental College, commencement of, 656
 Kélène, administration of, and extraction, 587
 Kemple, Frederick C., "Orthodontia as a Prophylactic Measure," 337
 Kentucky Board of Dental Examiners, 551, 1223
 Kentucky State Dental Association, announcement, 223
 Keokuk Dental College, commencement of, 658
 Kirk, Edward C., on cocaine injections, 556
 on the use of anesthetics, 556
 Kjær, Thorvald, "Case of Congenital Total Absence of the Permanent Teeth," 924
- LABIAL cavities, to secure dryness in, 533
 Labial retainer, 23
- Laboratory fillings, mixture of, separation of platinum, gold, and silver from, 411
 Lac, dental, cavity impressions with, 454
 Lactéal diet, exclusive, dental disorders caused by, 91
 Lactic acid, excess of, in the human system, 943
 in one per cent. solution, effect of, on tooth tissue, 112
 in root-canal treatment, 648
 Lake Erie Dental Association, announcement, 334
 La Roche, Wm. Tell, obituary of, 421
 Larynxes, artificial, 877
 Lateral bicuspid attachment in bridge work, 590
 Laterals, diminutive, restoration of, with porcelain, 513
 Le Cron, D. O. M., "Porcelain Inlays" (clinic), 195
 Le Cron, S. L., "Porcelain Cusps and Bridges Attached to Gold Bands" (clinic), 591
 Leonard, N. C., "Pressure Anesthesia and the Removal of Living Pulp," 505
 Leonard, Geo. R., resolutions of regret on death of, 778
 Lesions of the pulp, 124
 Lester, L. L., resolutions of regret on death of, 778
 Library, dental, of Columbus, Ohio, 1284
 of Springfield, Mass., 1283
 Ligature, an effective, 1105
 Light of various kinds, influence on plant life, 826
 Line, J. Edward, "The Aging of the Tissues with Special Reference to Given Forms of Dental Abnormality and Disease," 745
 Lippincott, J. T., president's address (Pennsylvania State Dental Society), 1065
 Lip pressure, effect of, 1154
 Litmus Test, Dr. Miller's (correspondence), 406
 Litmus paper tests of saliva, unreliability of, 807, 1292
 Littig, J. Bond, obituary of, 776
 resolutions of regret on death of, 1218
 Little helps, 214
 Local anesthesia in dental operations, 555, 1315
 Logan crown, adjusting a, 1109
 Los Angeles Association of Dental Alumni, 430
 Lower impression trays, essential requisites of, 1094
 Lower intermaxillary anchorage methods for retention, 26
 Lower plates, a system of utilizing atmospheric pressure for the retention of, 371
 Lymph capillaries, 306
 Lymphatic glands, 306
 Lymphatic stimulation in dental practice, 305
 Lymphatic system, description of, 306
- McAFEE, SAMUEL H., "Platinum Matrices and Pure Gold in Inlay Work," 817
 McAlpin, A., "Anchors" (clinic), 196
 McCullough, P. B., "Ground Porcelain Corners with Mechanical Anchorage," 143
 MacDonald, R., "A New Method of Obtaining Plaster Impressions in Difficult Cases," 278
 McDonald, Val., "Local Anesthesia in Dental Operations," 555
 McDougall, Samuel J., obituary of, 535
 McKay, W. W., "Porcelain Inlay, Using High-fusing Body" (clinic), 198
 McManus, Chas., "Pierre Fauchard," 1233
 "The Educational Influence of the So-called 'Dental Meeting' Apart from Its Professional or Social Value," 724

- McManus, Chas., "The Remarkable History of the Profession and the Splendid Character of the Men of the Past who Helped to Build It Up," 495
- McManus, James, president's address (Northeastern Dental Association), 835
- MacNamee, H., "Porcelain Fillings" (clinic), 590
- Madin, W. Thompson, "A New and Easy Method of Making Perfect Gold Fillings," 146
- Magitot on non-eruption of the permanent teeth, 928
- Maine Board of Dental Examiners, 675
- Maine Dental Society, announcement, 672, 1024
- Making gold bands, caps, and crowns without solder, 884
- Malasser's epithelial débris theory of radicular cyst development, 701
- Malignant growth, importance of the early diagnosis of, 982
- Malocclusion, adenoids in the etiology of, 820
a predisposing cause of pyorrhea alveolaris, 698
cases of, requiring extraction for their correction, 25
etiology as a factor in the treatment of, 1131
forms of, not classified, 1129
heredity in the study of, 857
in childhood, important causative factors, 1154
necessity for early treatment of, 930
of deciduous teeth, a corrected case of, 820
open-bite, a case of, 753
the Angle classification of, 1120
the influence of environment in the production of, 855
treatment of, at what age to begin, 821
- Mandible, case of follicular cyst of the, 1101
case of fractured, 91
double resection of, case of, 1002
gradual lengthening of, 1154
growth of, periods of activity and rest in, 1175
interstitial growth of, 853
necrosis of, involving entire alveolar process, the result of pericemental infection, 702
non-union of double fracture of, successfully treated, 728
post-typhoid osteomyelitis of, 262
- Mandibular angles, varied shapes of, 854
- Mandibular temporary ankylosis, 399
- Manhattan platinaid screw for extracting and building up of frail teeth, 591
- Manipulation of amalgam, 1314
- "Manual on the Art of the Dentist," by Jourdan and Maggiolo (1807), review of, by Platchick, 525
- Manual training in dental education, 469
- Marquette University, Department of Dentistry, commencement of, 659
- Marvin, C. A., obituary of, 777
- Maryland Board of Dental Examiners, 431, 1114
- Maryland State Dental Association and the District of Columbia Dental Society, union meeting, 582, 740
- Massachusetts Board of Registration, 224, 1116
- Massachusetts Dental Society, announcement, 429
officers of, 1181
proceedings of, 70, 159, 1181, 1270
report of Committee on Dental Medicine, 1181
- Massage in the treatment of pyorrhea alveolaris, 307
vibratory, results obtained from the practice of, 307
- Massage and manual manipulation, history of, 306
- Mastication, improper, disorders due to, 951
therapeutic value of, 97
thorough, necessity for, 810
- Matrices for porcelain inlays, 435
- Matrices, gold inlay, use of cement for the swaging of, 1004
of platinum and gold, comparative value of, 50
- Matrix (The) as an Aid in Cavity Preparation (correspondence), 729
- Matrix, burnishing of, technique of, 435
for gold inlays, swaged, preparation of cast of cavity, 1039
for inlays, materials for packing, 51
gold, for gold inlays, preparation of, 1036
method of adapting to cavity, 650
swaged, for inlays, 434
use of, 1180
with overlapping margins, 477
- Matthews, C. V., "Administration of Kélene and Extraction" (clinic), 587
- Maxilla, acquired atrophy of the, 1208
certain special forms of necrosis of, 319
- Maxilla, fractured, report of a case of, 390
suppurative inflammation of, the result of alveolar periostitis, 711
- Maxillary protrusion, a case of, 929
- Maxillary sinus, diseases of, generally traceable to the teeth, 555
empyema of, in the newborn, 644
treatment of, by the dentist, 555
variations in the size of, 643
- Measles, necrosis of the jaws following an attack of, 924
- Mechanical dentistry not the most important branch of the profession, 966
- Medical College of Virginia, Dental Department, commencement of, 659
- Medical colleges in the United States, statistics on, 1079
- Medical profession, ignorance of, on dental subjects, 981
- Medico-Chirurgical College, Dental Department, commencement of, 783
- Meharry Dental College, commencement of, 656
- Memorial (A) to Willoughby D. Miller (editorial), 1305
- Memorizing, Education and (editorial), 519
- Mendell, Guilhermena P., "A Corrected Case of Malocclusion of Deciduous Teeth," 820
- Mercurial stomatitis, present status of the question, 1206
- Metabolism, diagnostic value of urine analysis in, 1299
- Metallic capsules implanted in the jaws to serve as supports for artificial dentures, 1043
- Metals, base, deteriorated by age, 750
precious, not deteriorated by age, 750
- Metchnikoff's pioneer work on the "opsonic question," 571
- Method of cavity preparation with carborundum wheels, 1163
- Method of making inlays of gold, 41
- Methods and equipment for bedside dental treatment, 99
- Methylene blue in the treatment of cancrum oris, 1311
- Michigan Board of Dental Examiners, 548
- Michigan State Dental Association, announcement, 547
- Microscope, a new adaptation of, to dentistry, 358
use of, in dentistry, 981
- Miller (Professor) the Passing of (editorial), 997
- Miller, W. D., "Experiments and Observations on the Wasting of Tooth Tissue Various Designated as Erosion, Abrasion, Chemical Abrasion, Denudation, etc.," 1, 109, 225
"Further Investigations of the Subject of Wasting," 677
editorial on the death of, 997
list of the publications of, 1012
memorial resolutions on, 1014, 1110
obituary of, 1009
proposed memorial to, 1305

- Miller's observations, Joseph Head on, 801
 Minnesota Board of Dental Examiners, 224, 551, 1115
 Mississippi Dental Association, announcement, 428, 894
 Missouri State Dental Association, announcement, 548
 Mitchell, Geo. B., "Alveolar Infections: Extraction vs. Retention," 708
 "The Porcelain Rod in Dentistry," 31
 Mixing amalgam, 96
 Mixing cement, method of, 419
 Model, definition of the term, 458
 Modeling composition and plaster for making impressions for full upper denture, 775
 Models, duplication of, 69
 Modern orthodontia, purposes and accomplishments of, 1128
 Molar, an inverted third mandibular, 1102
 first, disturbances accompanying difficult eruption of, 1206
 first, loss of, affects speech, 1156
 first permanent, why it is the most important, 1156
 first, position determines nature of overbite, 1156
 Molar shell crown by the casting process, 1252
 Molars, deciduous, treatment of carious approximal surfaces of, 757
 rotation of, 1265
 Molars and bicusplids, impossibility of accurate adaptation of bands at the neck of, 690
 injuries resulting from faulty adaptation of bands to, 690
 reducing the contour of, prior to crowning, 486
 Moldable porcelain, showing its uses and manipulation, 513
 Monaghan, J. H., "America a Land of Unlimited Opportunities," 78
 Montana State Dental Society, 222
 Monthly record of patents relating to dentistry, 108, 224, 336, 482, 552, 676, 800, 908, 1024, 1116, 1224, 1320
 Moore, J. Hall, obituary of, 534
 Morphin, danger of treating cocaine poisoning with, 413
 Mouth, carcinoma of, 642
 care of minor diseased conditions of, 982
 congenital malformation of, 210
 most septic area in the human body, 944
 preparation of, for an impression: extraction, 774
 soft and flabby, to take an impression of, 98
 taking impressions of, attention to detail in, 649
 Mouth-breathing, an important factor in the causation of malocclusion, 856
 disastrous effects of, 838, 943
 Mouth-disinfection, 415
 Mouth-prophylaxis, 514
 Mouth-sterilization, solutions for use in, 945
 Mouth-wash, formula for, 946
 for diabetics, 1314
 for syphilitic ulcers, 529
 for thrush in infants, 529
 in pyorrhea alveolaris, 530
 of the "gunshot" type, formula for, 581
 Mouth-washes, rôle of, in eczema of the lip, 321
 Mucin, nature of, 230
 Mucoid degeneration, 1027
 Mucous membrane of the mouth, glycogenic infiltration of, caused by use of tooth-brush and irritating chemical agents, 1026
 histological description of, 1132
 tuberculosis of, 527
 types of degeneration of, 1025
 Mucous surfaces, hard, how to modify them in the impression, 97
 Mucus, fresh, acidity of, 229
 testing of, 228
 Mummifying paste, 512
 danger of indiscriminate use of, 941
 formula for, 941
 Muscles of expression, 380
 of mastication, tic of, appearing in the course of an alveolo-dental periostitis, 644
 Myers, N. H., "How to Make a Perfect Joint Between Root and Porcelain Crown" (clinic), 198
 NASAL breathing, defective, influence of, on growth and development, 531
 obstructed, interference with proper pulmonary expansion, 338
 Nasal catarrh simulated by discharge from alveolar abscess, 704
 Nasal obstruction, consequences of, 943
 Nasal route for approaching a diseased antrum, 917
 Nasal secretions, bactericidal properties of, 388
 Nasal stenosis and mouth-breathing in the causation of malocclusion, 856
 Nasal suppuration, dental ectopy and, 413
 National Association? (Shall We Nationalize Our) (editorial), 1198
 National Association of Dental Examiners, announcement, 222
 election of officers, 1113
 National Association of Dental Faculties, announcement, 426
 National Association of Physicians, Pharmacists, and Dentists, announcement, 895
 National Dental Association, announcement of 1907 meeting, 424, 541, 787
 certificate of incorporation of, 167
 clinics at 1906 meeting, 512
 committee on history of dentistry, communication from, 107
 election of officers, 1024
 general sessions, 164, 285
 president's address, 165
 report of Committee on Oral Hygiene, 202
 Section I, 373, 475
 Section II, 495
 Section III, 298
 Southern Branch, notice to members, 424
 Nebraska Board of Dental Examiners, 336, 1116
 Nebraska State Dental Society, announcement, 545
 Necrology report at Connecticut State Dental Association, 66
 Necrosis of mandible through pericemental infection, 703
 of the maxilla, certain special forms of, 319
 Necrosis and total loss of one or both jaws following certain diseases, 924
 Nellis, Francis D., obituary of, 216
 Nervous patients, factors to be considered in the selection of filling materials for, 883
 Nettleton, Geo. E., resolutions on the death of, 66
 Neuralgia, ointment for, 1314
 resulting from the capping of live pulp, 956
 syphilitic facial, contribution to the study of, 1103
 New Hampshire Board of Registration, 432, 1115
 New Hampshire Dental Society, announcement, 430
 New Jersey Board of Registration, 1115
 New Jersey State Dental Society, announcement, 885, 1114
 New Orleans College of Dentistry, commencement, 889
 New York College of Dentistry, commencement of, 782

- New York College of Dentistry, notice to alumni, 1318
- New York Odontological Society, proceedings of, 185, 387, 430, 616, 744, 1162
- New York State Dental Society, announcement, 222, 427
- clinics, 56
- proceedings of, 43, 1050, 1172, 1291
- report of Committee on Fellowship Medals, 1064
- report of Committee on Practice, 50
- Nickel-plated parts, care of, 645
- Nitrous oxid, comparison with other anesthetics as to safety, 1146
- fatalities under, 1143
- Nitrous oxid anesthesia, maintained for over two and one-half hours, 1144
- preparation of the patient for, 1146
- Nitrous oxid and oxygen, administration of, 1143
- as a general anesthetic, 1140
- cases in practice illustrating use of, 1144
- physiological action of, 1141
- possibilities and practicability of, 1140
- when introduced, 1140
- Noel, L. G., "Setting Crowns and Bridges with Gutta-percha," 453
- Nomenclature, dental, 574
- prosthetic, 456
- Non-cohesive gold, tooth-saving qualities of, 494
- Non-eruption of permanent teeth, report of various cases, 925
- Non-union of double fracture of the mandible successfully treated after a lapse of two months, 728
- "Normal" and "natural," definition of, 381
- Normal occlusion, definition of, 986
- North Carolina Board of Dental Examiners, 550
- North Carolina State Dental Society, announcement, 671
- North Dakota Dental Association, announcement, 799
- Northeastern Dental Association, announcement, 798
- president's address, 835
- proceedings of, 835, 961
- Northern Illinois Dental Society, announcement, 1114
- Northern Iowa Dental Society, announcement, 907
- North Pacific Dental College, commencement of, 784
- Northwestern University Dental School, commencement of, 892
- notice of annual clinic, 1318
- Nose and teeth, analogy between, 554
- Nose and throat, pathological conditions, of the primary cause of most cases of malocclusion, 820
- Nostrums, dental, remarks on, 1082
- Novocain and alypin, properties of, compared with those of cocain, 327
- Nurses, lectures to, on care of the teeth, 954
- Nutrition a factor in tooth-development, 1310
- OBSTACLES in crown and bridge work, 1205
- Obtunder, the Van Wyck, 518
- Obtunding sensitive dentin, a word of warning as to, 1211
- prescription for, 328
- Occipital retention, 28
- Occlusal line, variations in, 993
- Occlusion, effects on, of the loss of a tooth, 1174
- importance of studying the science of, 988
- normal, description of, 990
- Occluso-approximal cavities for inlays, method of obtaining impressions of, 832
- Ocular disturbances, reflex, of dental origin, 1308
- Odontotechnique Society of New Jersey, announcement, 333, 546, 1318
- Ohio Board of Dental Examiners, 550, 1222
- Ohio College of Dental Surgery, commencement of, 886
- Ohio Medical University, Dental Department, commencement of, 637
- Ohio State Dental Society, announcement, 105, 1221
- Oliver, R. T., on the status of the contract dental surgeon, 562
- Ontario Dental Society, announcement, 106
- Opening flasks, 325
- Open-bite malocclusion, a case of, 753
- Opening the bite, 343
- Operating, precaution to be observed before, 645
- Operating room, the right light in, 1314
- Operation for correction of maxillary protrusion, technique of, 929
- Operative dentistry, Nelson T. Shields on, 185
- "Opsonic index" of a patient, definition of, 572
- to ascertain, 572
- to raise, 572
- Opsonins, conclusions on, by Ross, 571
- Opsonism applied to pyorrhea alveolaris, 570
- Oral degeneration, senile, 1070
- Oral expressions of systemic diseases, 1293
- Oral hygiene, committee on, of National Dental Association, 169
- in public schools, 559, 1076
- efforts to advance, 563
- in the state association, 318
- necessity for, 563
- obstacles to the introduction of, 564
- Oregon State Dental Association, announcement, 333
- Orthodontia, 512, 518, 586
- as applied to the extraction of an impacted third molar, 589
- as a prophylactic measure, 337
- clinic by G. T. Baker, 1179
- definition of, 1262
- extraction in, 853
- from the standpoint of the orthodontist, 966
- in the restoration of normal nasal function, 389
- modern, purposes of, 1181
- prophylaxis in, 1075
- removable appliances in, 1077
- some practical points in, for the general practitioner, 1203
- V. H. Jackson on, 343
- Orthodontia and orthopedia of the face, 1262
- Orthodontia appliances, 163, 198
- the use of, 987
- Orthodontia cases, three, 148
- Orthodontia work, plaster impressions the only reliable ones in, 967
- Orthodontist should remember the particular type to which a patient belongs, 930
- should seldom resort to extraction, 932
- Osteomyelitis, post-typoid, of the mandible, 262
- Ottoly, Louis, "Free Dental Service in the Public Schools," 565
- Ottolengui, Rodriguez, "The Purposes and Accomplishments of Modern Orthodontia," 1128
- Oxalic acid, action upon tooth tissues, 113
- Overbite determined by position of first molar, 1156
- Oxyhydrogen Blowpipe, Mixture of Gases in (correspondence), 283
- Oyster-shell, powdered, its effect upon the teeth, 14
- PAIN after tooth-extraction, 325
- caused by an ill-fitting crown, 1069

- Pain during cavity preparation, how to avoid, 556
in a tooth, relieved by the use of the blue rays, 824
"reasonable limit" in, 557
- Palate, hypersensitive, to control when taking impressions, 213
identification by the shape of the, 774
- Palmer, Geo. B., "Technique of Taking Plaster Impressions for Orthodontia" (clinic), 1180
- Paramucin, 1027
- Paré, Ambroise, 1234
- Parenchymatous degeneration, 1025
- Paretic dements, degree of urinary acidity in, 1227
- Parker, Horace, obituary of, 1217
- Partial lower dentures, successful, 419
- Passing (The) of Professor Miller (editorial), 997
- Pathological conditions of the oral mucous membrane, antiseptic treatment of, 1132
- Pathological sense, the want of, 815
- Pathology, dental, James Truman on, 815
- Peck, A. H., "The Value of Association," 1080
- Pelicans, illustrations of, 1241
- Pennington, J. A., "Removable Bridges with Gold Inlay Abutments and Saddle and Vulcanite Attachment," 184
- Pennsylvania, new dental law for, 658
- Pennsylvania Board of Dental Examiners, 647, 1319
- Pennsylvania College of Dental Surgery, commencement of, 780
notice to alumni, 105
- Pennsylvania State Dental Society, announcement, 548
clinics, 194
president's address, 1065
proceedings of, 1085, 1173
- Perforation of root-canals, treatment of, 1045
- Perhydrol (hydrogen dioxide) in dentinal hyperesthesia, 97
- Pericemental abscess, bacteriological investigation of the pus from, 710
ichthyol in the treatment of, 529
- Pericemental infection, causing involvement of tonsils, pharynx, and larynx, 705
involvement of maxillary sinus the most common complication of, 705
systemic manifestations of, 705
- Pericemental inflammation, classification of, 695
direct causes, 699
of bacterial origin, consequences of, 702
pathology of, 695
predisposing causes, 696
- Pericemental irritation brought about by an ill-fitting crown, 301
- Pericemental membrane, aging of, 749
changes in, caused by inflammation, 699
- Pericementitis, a new method of treating, by means of local injections of sodium salicylate, 414
- Pericementum, Black's glands of, 697
structure and function of, 1046
- Perkins, Joseph L., obituary of, 216
- Perry, S. G., "A Discussion of the Merits and Demerits of the Gold Inlay, 392
on the professional status of the dentist, 561
- Phagocytosis, the study of, 571
- Pharmacopœia of 1900, changes and additions in, 841
the motto of, 573
- Pharmacopœial conventions, history of, 840
- Pharmacopœial revision, 573
- Pharyngitis and aphthous stomatitis, formula for, 773
- Philadelphia Dental College Alumni Society meeting, 544
- Philadelphia Dental College, commencement of, 890
- Phosphates, dibasic and acid sodium and acid calcium, action upon the teeth, 679
- Photography in orthodontia, 987
- Physical education and the white plague, 1258
- Physicians, number of, in New England states, 1080
- Pierre de la Brosse, dentist to Saint-Louis, 1284
- Pisan, Thomas de, dentist to Charles V, 1284
- Pittsburg Dental College, commencement of, 788
- Plaster and sand investment, 1313
- Plaster casts, to give a glossy surface to, 774
- Plaster impressions, a method of dividing, before removal from the mouth, 1107
for orthodontia, technique of taking, 1180
obtaining without the use of trays, 532
of difficult cases, 278
- Plaster of Paris, contraction and expansion of, 419
manipulation of, 1315
to prevent expansion of, 416
when first used for taking impressions of the mouth, 1041
- Plaster-of-Paris casts, expansion of, and its compensation by the contraction of zinc dies, 327
- Plaster work, newspaper strips in, 1212
- Plate, care of, after vulcanizing, 530
gold, making of, by the Taggart casting process, 1165
metal, accurately-fitting, easy method of making, showing very little vulcanite, 57
remaking, without a new impression, 529
to locate the irritating portion of, 529
- Plates, how to polish, 95
lower, retention of, by atmospheric pressure, 371
- Platinoid, composition of, 1104
- Platinum, gold, and silver, separation of, from a mixture of laboratory filings, 411
- Platinum and gold matrices, comparative value of, 50
- Platinum matrices and pure gold in inlay work, 817
- Polishing and grinding stones, to sterilize, 773
- Porcelain, attaching facings to caps with, 325
composition of, 436
desirable for approximo-occlusal cavities extending under the gingival margins, 434
effect of fusing at maximum temperature, 438
effect of over-fusing, 438
fusing of, 436, 470
high- and low-fusing, comparative merits of, 54
high-fusing, carving of, 198
high-fusing, method of overcoming contraction of, 588
jarring of, fatal to best results in, 1006
low-fusing, for mounting carborundum stones, 745
mixing of, 476
protection of, during soldering, 1105
restoration of diminutive laterals with, 513
scheme of matching the color of the tooth with, 479
veneering of, 196
- Porcelain bridges and pinless crowns, 197
- Porcelain catechism, 881
- Porcelain corners with mechanical anchorage, 148
- Porcelain crowns, burnished joint for, 883
- Porcelain facing, a gold corner on, 325
- Porcelain inlay for approximo-incisal cavities in anterior teeth, 163
- Porcelain inlays, 197, 433, 590
as compared with those of gold, 646
by the impression method, 1123, 1125
cavity preparation and formation of matrices for, 195, 434, 1215

- Porcelain inlays, color in, 436
 Dall's method, 32
 effect of the underlying cement on the color of, 1126
 fusing of, 438, 1125
 How's method, 33
 indications for, 434, 476
 reflected shadows of, 438, 442
 removal of the glaze for retention purposes, 51
 repair of, 369
 setting of, without removing matrix, 434
 Porcelain molar crown, 161
 Porcelain restoration of malformed and diminutive laterals, 513
 Porcelain restorations, large, anchorage pins for, 1214
 Porcelain-rod inlays, advantages of, 31
 Allen's method, 36
 cavities in which they are indicated, 47
 Guttman's method, 35
 objections to, 45
 Porcelain shades, making and recording, 590
 Porcelain tip, 209
 Porcelain tips and pieces from artificial teeth for filling purposes, introduction of, 32
 Position (The) of Dentistry (editorial), 1093
 Post-typhoid osteomyelitis of the mandible, 262
 Potassium iodid, a case of actinomycosis of the cheek cured by, 527
 Potassium sulfoeyanate in saliva, analysis to determine the presence of, 1179
 Potassium sulfoeyanid, action upon sound teeth, 242
 Precautions in soldering, 1109
 Precious metals not deteriorated by age, 750
 Pregnancy, dental caries during, 1104
 Pregnancy and erosion, 1295
 Prerogative (The Editorial) (editorial), 868
 Presence of teeth at birth, 1104
 Pressure anesthesia for pulp-removal, 505
 Limitations of, 940
 Preventive dentistry, 614, 756, 1090
 Preventive medicine, 1136
 Priessnitz, Vincenz, the father of modern hydrotherapy, 573
 Priority (The Question of) Again: The Matrix as an Aid in Cavity Preparation (correspondence), 834
 Prognathism in a child two years old, 853
 unilateral, a case of, 348
 Prophylactic dental treatment, 1188, 1285
 Prophylactic measure, orthodontia as a, 337
 Prophylaxis, dental, 387, 503, 1074
 spraying with antiseptic solutions in, 1075
 Prosthesis, definition of, 379
 Prosthetic hints, 326, 1213
 Prosthetic nomenclature, Geo. H. Wilson on, 456
 Protecting porcelain surfaces for solder work, 95
 Proteol in the treatment of infected root-canals, 1312
 Protrusion, double, 1130
 Pseudo-mucin, 1027
 Pseudo-odontalgia of grippal origin, 999
 Psi Omega Fraternity, 785
 Ptyalism, remedy for, 1105
 Public dental library for the city of Columbus, Ohio, 106
 Pulmonary abscess caused by a tooth, 99
 Pulmonary tuberculosis, relation of dental disorders to, 92
 Pulp, absence of collateral circulation in, 125
 aging of, the, 748
 anesthetization of, in the presence of pulp-nodules, 58
 engorgement of the vessels of, as a cause of odontalgia, 127
 fibroid degeneration of, 127, 130
 Pulp, irritation of, through mechanical abrasion a cause of facial neuralgia, 1002
 living, capping of, 958
 living, removal of, under pressure anesthesia, 505
 methods of anesthetizing, 1006
 non-vascular character of the veins of, 125
 putrescent, formalin and tricresol in combination in the treatment of, 158
 vascular lesions of, 124
 Pulp-amputation, when advocated, 1042
 Pulp-capping, an important physiological requirement of, 325
 hydonaphthol as a, 416
 Pulp-devitalization, technique of, 941
 Pulp-infection and suppuration simulating pyorrhea, 302
 Pulpless teeth, appearance of, 439
 to avoid darkness in, 615
 Pulp-mummification, 940, 1160
 Pulp-removal in pyorrhea, 249
 Pulp-stones, cause of, 1044
 Pumice, effect upon the teeth of continued brushing with, 226
 Purifying scrap gold, 1179
 Purulent nasal discharge in antral suppuration, 911
 Pus, direction taken by, in abscess associated with an incisor, 919
 from pericemental abscess, bacteriological investigations of, 710
 Putrescent pulps, 416
 oil of turpentine in the treatment of, 1106
 Pyemia the result of pericemental infection, 704
 Pyorrhea alveolaris, a rare complication of, 320
 auto-intoxication as constitutional cause of, 812
 bridge work in, 248, 514
 cases of, improvement of, under a vegetable diet, 1192
 complicated with alveolar abscess, 303
 due to arterio-sclerosis, 749
 gouty, 303
 malocclusion a factor in the causation of, 339
 massage in the treatment of, 249, 307, 751
 mouth-wash in, 530
 origin of, 311, 570
 predisposing causes of, 341
 pulp-infection and suppuration simulating, 302
 report of treatment of five cases, 252
 some observations on the bacteriology of, 878
 splinting in, 261, 304
 therapeutics of, 213, 775
 treatment of, 247, 756, 1186, 1213
 Pyorrhea alveolaris and pericemental abscess, common origin of, 697
 Pyorrheal pockets, treatment of, 1135
 Pyrometer, the value of, 54
- QUESTION (A) of Journalistic Ethics (editorial), 82
 Quinckerot, Ch. L., "Manual of Dental Therapeutics, Odontotherapy," review of, 88
- RADICULAR or pericemental cysts, 700
 Radiograph, diagnosis of abscess by, 302
 Radium emanation and transmutation of elements, 1216
 Randolph (Mo.) Dental Society, announcement of, 672
 Ranula, a case simulating, 71
 Rays, blue, in dental therapeutics, 824
 Reaction, The Amphoteric (editorial), 404

- Reaction, amphoteric, 677
 Recreations for the dentist, with some basic requirements, 1255
 Recurrent bullous stomatitis, 639
 Regulation of a malposed incisor, technique of the operation, 986
 Remaking a plate without a new impression, 529
 Remedies, some useful, 208
 Removable bridges with gold inlay abutments and saddle and vulcanite attachment, 154
 Removable posts, 100
 Repair of porcelain fillings, 369
 Repairing porcelain facings, 56, 329
 Replacing a facing on an anterior bridge, method of, 533
 Replantation, a case of, 528
 Report of case of extensive injury to the bones of the face, 262
 of Committee on Oral Hygiene (National Dental Association), 292
 of Committee on President's Address (National Dental Association), 298
 of Finance Committee of the Fourth International Dental Congress, 287
 of San Francisco Dental Relief Committee, 632
 of Treasurer of the Fourth International Dental Congress, 291
 Resection, of the apex, 1813
 of the mandible, case of double, 1002
 Resetting a bridge without removing it from the mouth where one of the anchorage points has become loosened, 215
 Resorption of the roots of a molar in the course of senile alveolar atrophy, 771
 Retained deciduous teeth, extraction of, not an advisable procedure, 923
 Retainer, labial, 23
 Retaining appliances, care of, 1210
 Retaining forces, supplementary, as auxiliaries to labial retaining appliance, 23
 Retention, direct intermaxillary, 27
 intermaxillary, 25
 lower intermaxillary, anchorage methods for, 26
 methods of, when teeth have been moved bodily, 28
 of arches expanded laterally, 24
 Retrusal movements, retention of, 25
 Review by Platschick of the "Manual on the Art of the Dentist" by Jourdan and Maggiolo (1807), 525
 Rhazes, the initiator of the operation of filling teeth, 496
 Rheumatism, relation of, to wasting (erosion) of tooth-substance, 235
 Rhode Island Board of Registration, 335, 675, 1114
 Richards, Walter, "Diastoric Teeth in Crown and Bridge Work" (clinic), 197
 Richmond crown, objection to, 578
 a bandless, 882
 Roach, F. E., "Moldable Porcelain, Showing its Uses and Manipulation" (clinic), 513
 Riggs' pyorrhea instruments, 1189
 Roberts, G. Arthur, obituary of, 652
 Roentgen rays, use of, in the cure of epithelioma of the lip, 1003
 Rogers, Alfred P., "Appendix to Article on 'Facial Inharmonies,'" 980
 "The Correction of Facial Inharmonies," 850
 Root, banding of, 1246
 Root and porcelain crown, how to make a perfect joint between, 198
 banding of, with gold to restore contour between root and crown, 161
 Root-canal, method of determining the length of, 1044
 treatment and filling of, 1044
 Root-canal broaches, handling and sterilizing, 417
 Root-canal filling, 646
 immediate, 1193
 Root-canal instruments, sterilization of, 644
 Root-canal sterilization, 1193
 Root-canal treatment, lactic acid in, 648
 therapeutic value of creosote in, 1008
 Root-canals, hot water in the treatment of, 1195
 treatment of, 1192
 Root-filling, immediate, objection to, 645
 Root-preparation for porcelain crowns, 590
 Rose, W. S., "Co-operation in Dentistry," 730
 "Reinforced Porcelain-Face Shell Crowns" (clinic), 57
 Rotation of canines, bicuspsids, and molars, 1265
 Rotterdam Dental Society, prize offered by, gnathodynamometer wanted, 662
 Royal College of Dental Surgeons of Ontario, commencement of, 779
 Rubber dam, placing of, immediately after removal of pulp under pressure anesthesia, 508
 Rubber-dam method of abutment preparation, interchangeable facings, and cementation, 484
 Rust, D. N., president's address (union meeting of Maryland State Dental Association and District of Columbia Dental Society), 582
 Rusting, prevention of, by means of gum-resin euphorbium, 640
 SADDLE-VULCANITE attachment removable bridge, 154
 Sadler, R. O., "The Manhattan Platinoïd Screw for Extraction and Building Up of Frail Teeth" (clinic), 591
 St. Louis Dental College, commencement of, 660
 notice to alumni, 428
 St. Louis Society of Dental Science, organization of, 223
 Saliva, acid sodium phosphate in, 1291
 action of food and crystalline bodies in, 20
 analysis of, to determine the presence of potassium sulfocyanate, 1179
 chemical composition of, 1133
 currents of, mechanical action of, upon the teeth, 20
 germicidal action of, 1134
 in fifty-two cases of wasting, 227
 inhibitory power of, upon the action of acids, 806
 methods of finding reaction of, 1292
 of amphoteric reaction, devoid of action upon teeth, 679
 quantity secreted, 1133
 reaction of, before and after eating, 227
 Saliva secretion, effect of psychic influences on, 1133
 Saliva tests with litmus paper, unreliability of, 807
 Salivation, remedy for, 1105
 Salol in Tooth-powder (correspondence), 471
 San Francisco Dental Relief Committee, report upon, 632
 San Francisco Dental Society, announcement, 223
 Salvas, J. Clarence, "Traumatic Lesions Incident to Crowns and Bridges," 1046
 Sarcoma, difficulty of diagnosing, 984
 Sausser, E. R., "Porcelain Veneering" (clinic), 106

- Sawyer, A. J., "To Replace a Broken Facing on a Bridge in the Mouth" (clinic), 162
- "To Restore a Root so that the Gold Will Restore Accurately the Contour Between the Root and the Crown" (clinic), 161
- Scarlet fever, perforation of the soft palate in, 771
- Schamberg, M. I., "The Extraction of Teeth a Surgical Procedure," 354
- School children, examination of the teeth of, 887, 949, 1275
- lack of dental care in teeth of, 953
- removal of adenoid growths from, 950
- Scientific investigation, value of, in dentistry, 966
- Scurvy, infantile, its manifestations and diagnosis, 768
- Sealing dressing, cement in combination with absorbent cotton as a, 880
- Sea-lion, defects on the teeth of, resembling wasting in human teeth, 680
- Second District (N. Y.) Dental Society, announcement, 799
- Self-cleansing spaces, cutting in approximal surfaces, when introduced, 1042
- Sensitive cervical margins, treatment of, 825
- Sensitive dentin in gingival cavities, obtunding, 881
- Sensitivity of the face, preservation of, after destruction of the fifth nerve, 876
- Septicemia, ending in death, the result of pericemental infection, 707
- of bucco-dental origin, 711
- Seton, use of, in salivary cysts, 71
- Setting crowns and bridges with gutta-percha cement, 328
- Seventh District (N. Y.) Dental Society, announcement, 333
- union meeting with Eighth (N. Y.) District, 730, 980
- Severe infection, three cases of, of dental origin, 640
- Shall We Nationalize Our National Association? (editorial), 1198
- Shell crown, method of setting, 1005
- Shields, Nelson T., "Operative Dentistry," 185
- "Treatment and Filling of Root-canals," 1044
- Shrinkage in soldering, method of preventing, 67
- Silver nitrate, application of, 417
- care in the use of, 417
- in preventive dentistry, 1090
- treatment of teeth with, conclusions on, 1091
- use of, under cement fillings, 645
- Silver nitrate stains, to prevent, in tooth-structure, 1091
- Silver salts, therapeutic significance of, 879
- Sixth District (N. Y.) Dental Society, announcement, 546
- Skigraph, use of, in dental diagnosis, 967
- Skidmore, Luther W., obituary of, 420
- Slab for mixing cement, 745
- Smith, B. Holly, "Recreation for the Dentist," 717
- Smith, H. Carlton, "Appliances Used in Testing Amalgam Cements, etc." (clinic), 161
- "Lecture-Notes on Chemistry for Dental Students," etc., review of, 87
- Smith, L. A., demonstration of a method of measurements for ordering facings, crowns, etc., for special cases, 518
- Soap as an antiseptic, 1105
- Sodium phosphate, acid, action upon tooth-structure, 229, 1291
- in the saliva, 1291
- power of weak solutions of, to act on enamel, 802
- Sodium salicylate, local injections of, in the treatment of pericementitis, 414
- Soft palate, extensive perforation of, cured by medicinal means, 770
- perforation of, in scarlet fever, 771
- Soldering, autogenous, 501
- precautions in, 1109
- Soldering bridge work, method of preventing shrinkage in, 67
- Soldering clamp, a, 212
- Soldering flux, 1004
- Solution of gutta-percha, in chloroform, to hasten, 416
- Solutions to be used in mouth-sterilization, 945
- Somnoform, opinions on the value of, in dental surgery, 1146
- South Carolina Board of Dental Examiners, 552
- South Carolina State Dental Association, announcement, 797
- South Dakota Board of Dental Examiners, 107, 550, 1320
- South Dakota Dental Society, announcement, 335, 547
- Southern California Dental Association, announcement, 106
- Southern Dental College, commencement of, 658
- Southern Nebraska Dental Society, announcement, 105
- Southern Wisconsin Dental Association, announcement, 426, 799
- Specialism in dentistry, 989
- Speech, affected by loss of first molars, 1156
- influence of malocclusion on, 1176
- Spence metal for mounting carborundum, 745
- Spirocheta pallida, 1137, 1286
- Splinting in pyorrhea alveolaris, 261, 303
- Splints for the lower anterior teeth, 215, 327
- Spraying the mouth in dental operations, 984
- Sprays, antiseptic, in the treatment of the oral mucous membrane, 1134
- Spring clasp in orthodontia work, 1265
- "Sprue" wire, the, 1165, 1252
- Squires, G. Brenton, "The New Pharmacopoeia," 840
- Stanley, N. A., "Porcelain Molar Crown" (clinic), 161
- "The Use of the Matrix" (clinic), 1180
- State Dental College, Texas, commencement of, 660
- State University of Iowa, College of Dentistry, commencement of, 1111
- Sterilization of dentures, 95
- of engine handpieces, 416
- of root-canal instruments, 644
- of root-canals, preparation for, 1193
- Stevens, Alonso H., obituary of, 585
- Stewart, H. T., "Bridge Work in Pyorrhea" (clinic), 514
- "Sticky-wax," sticks of, method of obtaining by casting in glass tubes, 530
- Stockwell, C. T., "The Relation of Diet to Interstitial Gingivitis," 808
- Stomatoprophylaxis, 514
- Stomatitis, mercurial, present status of the question, 1206
- recurrent bullous, 639
- treatment of, 412
- Strickland, Isaac, obituary of, 1218
- Sublingual leukokeratosis, 208
- Submaxillary and parotid infection resulting from suppurating sockets of teeth, followed by thrombosis of cavernous sinus and death, 711
- Substitute (A) for Pin Facings in Repairing Bridges (correspondence), 1161
- Summa, Richard, "Some Thoughts Concerning the Contact of the Teeth," 373

- Supplementary retaining forces as auxiliaries to the labial retaining appliances, 23
- Suppuration due to pulp-infection simulating pyorrhea, 302
- Surgeon-dentists, the early French, 1234
- Susquehanna Dental Association of Pennsylvania, announcement, 546
- "Sweat," meaning of the term as applied to prosthetic dentistry, 460
- Syphilis, diagnosis by presence of spirocheta pallida in the mouth, 1286
- Syphilitic facial neuralgia, contribution to the study of, 1103
- Syphilitic lesion of the temporo-mandibular articulation, case of, 414
- Syphilitic ulcers, mouth-wash for, 529
- Systemic conditions, influence of, on certain serious complications of dental caries, 210
- Systemic infection, of dental origin, three cases of, 1098
- TABETICS, degree of urinary acidity in, 1227
- Taggart, W. H., "A New and Accurate Method of Making Gold Inlays," 1117
- Talbot, Eugene S., "Acid Auto-Intoxication and Systemic Disease the Cause of Erosion and Abrasion," 1225
- Talc, gritty, impurities of, 109
- Tannin, use of, in painful tooth-affections, 1314
- Tartar, behavior of, under the wasting process, 10
- Taylor, C. R., obituary of, 101
- Taylor, L. C., "Method of Filling Small Cavities in Children's Front Teeth" (clinic), 159
- Teeth, action of carbonic acid on, 114, 115
- action upon, of iron preparations, 1103
- action upon, of prepared chalk, 9
- action upon, of acid sodium and calcium phosphates, 1291
- action upon, of acid solutions in motion, 116
- action upon, of acids alternating with substances which destroy tooth tissue, 243
- action upon, of substances which attack the organic constituents in conjunction with mechanical agents, 240
- anterior, method of constructing crowns for, 578
- artificial, setting up, on wax, 200
- causes of erosion of, 2
- changes in, at different periods of life, 1226
- changes in color of, with age, 1231
- children's, preservation of, 186, 1004, 1212
- contact of, 373
- deciduous, consequences of premature loss of, 1154
- deciduous, functions of, 1154
- deciduous, prolonged retention of, 1155
- defective, in England, Germany, and Sweden, statistics on, 1271
- defective, physical deterioration caused by, greater than that caused by alcohol, 1271
- deleterious effect upon, of the grape and orange cure, 230
- diatoric, in bridge work, 163, 197
- effect upon, of continued brushing with pumice, 226
- effect upon, of grits in conjunction with tooth-brushes, 1291
- effects of brushing with calcium carbonate, 109
- effects of disuse of, 342
- elongated and irregularly opposing, mechanical treatment of, 758
- eruption of, influenced by general systemic conditions, 922
- Teeth, extraction of, a surgical procedure, 354
- filling of, with gutta-percha, 1005
- fractured during extraction, 398
- frequent polishing of the necks and massage of the gums in treatment of recession, 755
- general wasting of, 689
- human, wasting undermining the enamel walls, 688
- importance of keeping a clinical record of those treated, 920
- investigations on the effect of high temperature on, 876
- loosened by pyorrhea, treatment of, 1263
- loss of, in childhood, and its effect on occlusion and the face, 1153
- lower anterior, splints for, 327
- lower, cocainization of the inferior dental nerve for the painless extraction of, 320
- macroscopic characteristics of, as a sequela of severe febrile diseases, 922
- necessity for the care of, little understood by the public, 560
- nutritional disturbances affecting, attributable to catarrhal affections, 553
- of animals, resembling wasting in human teeth, 680
- of children, prophylactic treatment of, 1075
- of different grades, susceptibility to abrasion, 15
- of school children, examination of, 566, 611
- permanent, a case of congenital total absence of, 924
- permanent, effect of tardy or non-eruption of, 1156
- permanent, pathologic causes of complete absence of, 925
- permanent, report of a case of non-eruption of, 927
- presence of, at birth, 1104
- relation of, to ear and throat diseases, 553
- sound, action of potassium sulfocyanid on, 242
- to be crowned, when should the pulp be devitalized? 1107
- variations in anatomical structure of, 921
- wasting of, 22
- wearing of, action of saliva, of food, and of crystalline bodies on, 20
- Teeth, alveoli, and gum, injurious effect upon, of the fruit-habit, 1229
- Teeth and digestive tract, relation between, 554
- Teeth and eye, ear, and throat, connection between, cases illustrating, 968
- Temporary plate, to replace tooth on, 880
- Temporo-mandibular articulation, a case of syphilitic lesion of, 414
- Tennessee Board of Dental Examiners, 549
- Tennessee State Dental Association, announcement, 335, 548, 672
- Teter, C. K., "Nitrous Oxid and Oxygen: Its Possibilities and Practicability as a General Anesthetic," 1140
- Texas Board of Dental Examiners, 336, 1223
- Texas State Dental Association, announcement, 429
- Therapeutic notes, 772
- Therapeutic significance of the silver salts, 879
- Therapeutic value of mastication, 97
- Therapeutics of pyorrhea alveolaris, 775
- Third, Fourth, and Fifth District (N. Y.) Dental Societies, joint meeting, 1022
- Thompson, C. N., "Reflected Shadows Accompanying Porcelain Fillings," 438
- Thorpe, Burton Lee, "Manual Training an Essential to Dental Education," 469
- Throat and middle ear, pathogenic connection between, 554

- Throat diseases and neglect of the teeth, 555
 Thumb and finger sucking as the cause of dental irregularities, 857
 Thymic acid, action of, upon tooth tissue, 118
 Thymocamphene, 880
 Thymoform, demonstration of its various uses, 68
 Thymol, description of physical properties of, 941
 Thymol-camphor, 1214
 Tic of the muscles of mastication appearing in the course of alveolo-dental periostitis, 644
 Tightening screw connections, 1210
 Tileston, H. B., "Hollow Gold Inlays" (clinic), 515
 Tilley's observations on connection between antral abscess and diseased teeth, 910
 Tin, cohesive, and gold, combination filling, 518
 Tin cylinders, corrugated, as a filling material, 494
 Tincture of iodine, injections of, in the treatment of fistulae of dental origin, 1003
 Tin points, filling root-canals with, 1193
 Tipping facings with gold, 773
 Tipping of teeth during expansion of arch, to prevent, 1287
 Tissue disuse as a cause of degeneration, 1073
 Tissues, aging of, with special reference to given forms of dental abnormality and disease, 745
 chemical changes in leading to true degeneration, 1025
 Tobacco, action of, upon the teeth, 773
 Tompkins, H. H., "Practical Novelities in Porcelain" (clinic), 56
 Tonsillitis, chronic lacunar, due to a depraved dental condition, 553
 Tooth, anterior, method of supplying, 153
 blue, leakage of filling, cause of, 960
 deciduous, effect of brushing with gritty tooth-powder, 109
 deciduous, the one most frequently sacrificed, 1154
 displaced, in the nasal cavity, causing fetid vomiting, 883
 extraction of, a case of amaurosis caused by, 875
 extraction of, followed by cure of chronic headache and defective sight, 534
 first molar, importance of preservation of, 566
 lower molar, severe hemorrhage following extraction of, 524
 misplaced anterior, correction of, by means of porcelain, 985
 molar, resorption of the roots of, in the course of senile alveolar atrophy, 771
 natural, and porcelain, difference between, in reaction to light, 439
 permanent canine, difficult eruption of, 772
 preparation of, for flush-joint crown, 692
 pulpless, color of, 439
 single, how to make fusible metal impression of, 1005
 Tooth-abrasion, two cases of, successfully treated, 592
 Toothache, relief from, 774
 Tooth-brush and tooth-powder, mechanical action of, in the production of tooth-wasting, 3, 13
 Tooth-carving as an aid in inlay work, 435
 Tooth-constituents, organic, action of substances which attack, 237
 Tooth-development, nutrition a factor in, 1310
 period covered by, 922
 Tooth-extraction a surgical procedure, 354
 Tooth-follicles of first and second dentition, relate to dissimilar life-periods, 925
 Tooth-gemination, etiology of, 879
 Tooth-irregularity, the most common form of, 990
 Tooth-paste containing talc, action of sediments of, in glass, 109
 Tooth-powders, 531
 Tooth-roots, bulbous swelling on, 700
 Tooth-structure, effect upon, of brushing with a much-used English tooth-paste, and with powdered oyster-shell, 12
 effect upon, of prepared chalk, 14
 Tooth-substance and fillings, comparative wearing of, 17
 Tooth tissue, action of oxalic acid upon, 113
 Tooth-wasting (abrasion) artificial production of, caused by tooth-brush and powder, clinical observations on, 3, 4
 Tracy, M. C., "A New Idea in Root-Preparation for Porcelain Crowns" (clinic), 590
 Transillumination, the shadow in, 912
 in the treatment of antral suppuration, 912
 of little value for children under twelve, 918
 regulation of the light in, 912
 variation of the antra noticed in, 912
 Traumatic lesions incident to crowns and bridges, 1046
 Tray, for carrying impression wax to cavity, 1039
 for obtaining impressions of cavities, 832
 lower impression, selection of, 1004
 to obtain plaster impressions without, 532
 Treatment, antiseptic, of pathological conditions of the oral mucous membrane, 1132
 of abrasion and chemico-abrasion of the teeth, 245
 of deciduous teeth, 186
 of non-union of double fracture of the mandible, 728
 of pyorrhea alveolaris, 247, 252, 1213
 of stomatitis, 412
 of teeth loosened by pyorrhea, 1263
 Treatment and filling of root-canals, 1044
 Trigger, T. C., "Gold Inlays in Compound Cavities in Molars, Involving the Mesio-occluding and Disto-occluding Surfaces," 1034
 Tripp, Jerome Plummer, obituary of, 421
 Trotter, W. C., "An Easy and Inexpensive Method of Making an Accurately Fitting Metal Plate, Showing Very Little Vulcanite" (clinic), 57
 Trueman, Wm. H., "A Vacancy in Dental Journalism," 466
 Truman, James, "Wanted!—A Pathological Sense," 815
 Tuberculosis, a fatal case of, acquired through the use of a septic dental scaler, 944
 of the mucous membrane of the mouth, 527
 physical education in the prophylaxis of, 1253
 Tufts College Dental School, commencement of, 891
 Tumors of the jaws, pathology and treatment, 1099
 Turner, Chas. R., "The American Text-book of Prosthetic Dentistry," review of, 406
 Two Great Meetings (editorial), 873
 Tympanum, chronic purulent inflammation of, in connection with dental disorders, 534
- UNIVERSITY College of Medicine, Department of Dentistry, commencement of, 779
 University of Buffalo, Department of Dentistry, commencement of, 780
 University of California, College of Dentistry, commencement of, 894
 University of Illinois, College of Dentistry, 899
 University of Maryland, Dental Department, commencement of, 890

- University of Michigan, College of Dentistry, commencement of, 892
- University of Minnesota, College of Dentistry, commencement of, 898
- University of Pennsylvania, Dental Department, dental alumni society, 548
- commencement of, 781
- reunion of class of '02, 544
- University of Southern California, Dental Department, commencement of, 886
- Upper plates, stability of, without the use of air-chambers, 1005
- Urine, compounds responsible for acidity of, 1297
- Urine acidity, method of obtaining degree of, 1228
- Utah State Dental Society, announcement, 671
-
- VANDERBILT University, Department of Dentistry, commencement of, 888
- Van Horn, C. S., "A Rambling Discourse on Inlays," 827
- "Cavity Preparation for Porcelain Inlays, Illustrating Principles Conducive to Retention and Adaptation" (clinic), 195
- Van Woert, F. T., "Is the Cemented Filling the Filling of the Future?" 1121
- Van Wyck, Crittenden, "The Van Wyck Obtunder" (clinic), 518
- Vascular lesions of the dental pulp, their complications and clinical significance, 124
- Vaseline, to perfume, 1211
- Veneering with porcelain, 196
- Vermont Board of Dental Examiners, 552
- Vermont State Dental Society, announcement, 228, 799
- Virginia Board of Dental Examiners, 549
- Virginia State Dental Association, announcement, 672
- Vital statistics, dental, 882
- Vocabulary of terms used in prosthetic dentistry, 460
- Voelker, C. C., "A Method of Making Hollow Gold Inlays" (clinic), 195
- Vulcanite pinless teeth in crown and bridge work, 590
- Vulcanite plates, flexible edge for, 1062
- Vulcanized rubber, prevention of air-spaces in, 96
-
- WARD, SULLIVAN LAWRENCE, obituary of, 1217
- Ware, Martin W., "Plaster of Paris and How to Use It," review of, 767
- Washington University, Dental Department, announcement, 334
- commencement of, 784
- Wassall, Joseph W., "Extensive Gold Inlays and Their Application to Bridge Work," 690
- Wasting of the teeth (abrasion), a case of, caused by the action of tooth-brush and powder, 225
- absence of, in Poliklinik patients, Leipzig, 21
- action of mechanical agents in, 3, 246
- among the Japanese, 22
- due to the grape and orange cure, 230
- experiments and observations on, 1, 109, 225, 677
- general, 689
- in uncivilized races, 22
-
- Waters, T. S., "Orthodontia as Applied to the Extraction of an Impacted Third Molar" (clinic), 589
- Watling, J. A., "Dental Instrument Making" (clinic), 590
- Watson, F. R., "Filling Lower Cervical Cavities with Gold without the Rubber Dam" (clinic), 57
- Wax, hard, in the technique of matrix burnishing, 435
- "sticky," to obtain sticks of, by casting in glass tubes, 530
- Wedge-shaped defects, 2
- Wedging principle of manipulating non-cohesive gold, 67
- Wedging preparatory to extraction of an impacted third molar lying against the second molar, 774
- Weeks, S. Merrill, "Three Orthodontia Cases," 148
- Western Dental College, commencement of, 656
- Western Reserve University Dental School, commencement of, 898
- West Virginia Board of Dental Examiners, 432
- Wetherbee, I. J., "Tin and Gold" (clinic), 164
- What Has Become of It? (editorial), 1201
- White, Gordon, "Treatment of Pyorrhea Alveolaris," 247
- White, W. A., president's address (New York State Dental Society), 1050
- Whitford, Edwin, "Our Old Standbys," 936
- Williams crown, the, 273
- Williams, D. B., "A Time-Saving Attachment for the Arch Bar," 1260
- Williams, Jacob L., obituary of, 421
- Williams, J. Leon, "Gold, or Gold and Platinum, Cemented Linings for Amalgam and Gold Fillings," 1157
- Willis, F. M., "Pulp-mummification," 940
- Wilson, Geo. H., "Phases of Art in Prosthesis," 379
- "Prosthetic Nomenclature," 456
- Wilson, Henry Donald, obituary of, 1110
- Winkle, A. F., obituary of, 652
- Wire, the "sprue," 1165, 1252
- Wires used in orthodontic operations, sterilization of, 944
- Wisconsin Board of Dental Examiners, 107, 550
- Wyoming Board of Dental Examiners, 675
-
- X RAY, as an aid to correct diagnosis, 302
- in root-diagnosis, 1155
- X-ray examinations, usefulness of, in dentistry, 920
- X rays, value of, to dentists and rhinologists, 918
-
- YOUNG, D. H., "A System of Utilizing Atmospheric Pressure for the Retention of Lower Plates," 371
- "The Carbon System of Constructing a Porcelain-face Crown" (clinic), 516
-
- ZINC oxid, physical properties of, 941
- Zinc oxyphosphate cement, mixing of, 214

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